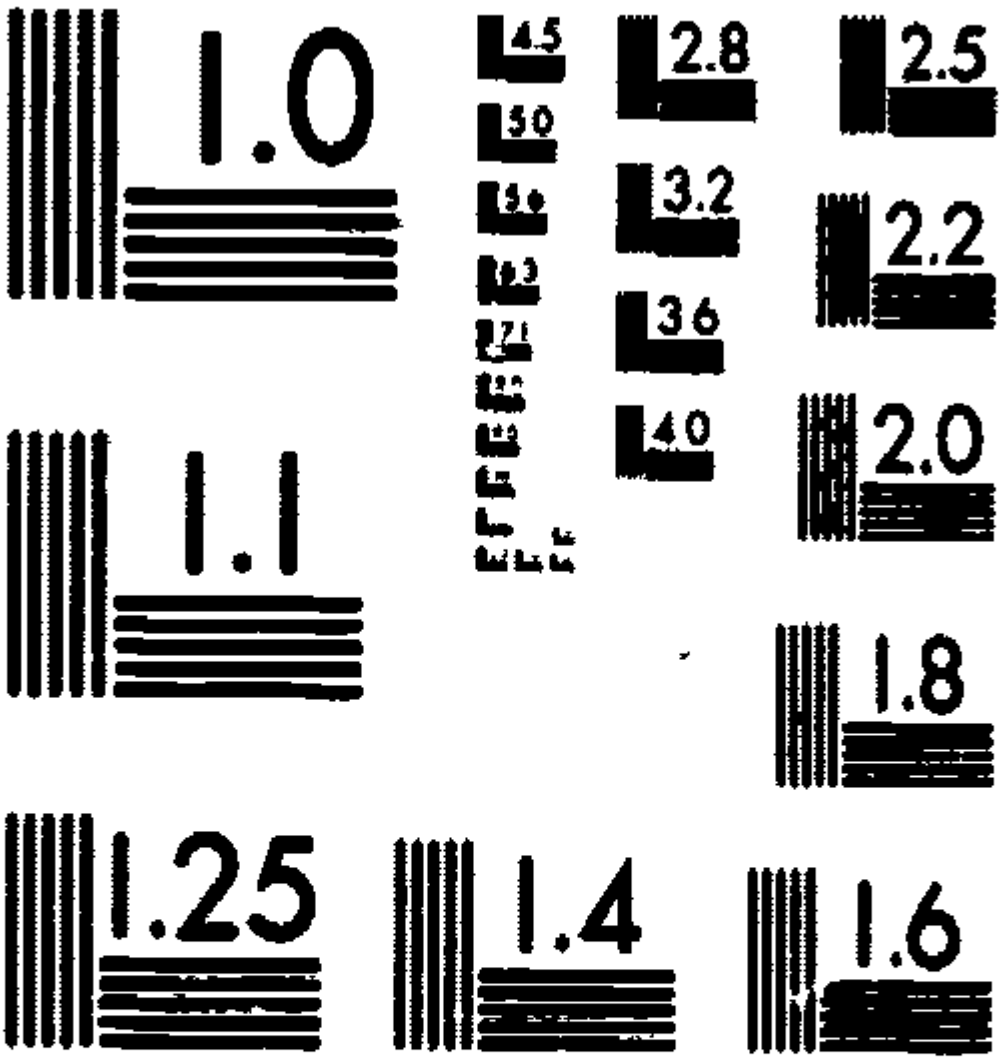

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ABSTRACT

Women's gymnastics from June 1973 - June 1975 are discussed. Standards in sports for girls and women are detailed as is the Division for Girls and Women's Sports (DGWS) statement of beliefs. Specific articles dealing with beam routines, handsprings and Yamashita vaults, uneven bar routines, and prevention of injuries are included. The booklet discusses DGWS compulsory routines and presents information on standards for official ratings, the officiating executive board, and techniques of officiating gymnastics. (BRB)

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JUNE 1973 – JUNE 1975

With Official Rules

Editor
Lu Wallace

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CONTENTS

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The Division for Girls and Women's Sports is a nonprofit educational organization designed to serve the needs and interests of administrators, teachers, leaders, and participants in sports programs for girls and women. It is one of eight divisions of the American Association for Health, Physical Education and Recreation. Active members of the Division are women members of the American Association for Health, Physical Education, and Recreation who are interested in sports for girls and women and who participate in the work of the Division. These women are professional leaders in schools, colleges, community centers, industrial plants, military services, public and private clubs, and agencies.

The purpose of the Division for Girls and Women's Sports is to foster the development of sports programs for the enrichment of the life of the participant.

The Division for Girls and Women's Sports attempts to promote desirable sports programs through:

1. Formulating and publicizing guiding principles and standards for the administrator, leader, official, and player.
2. Publishing and interpreting rules governing sports for girls and women.
3. Providing the means for training, evaluating, and rating of officials.
4. Disseminating information on the conduct of girls and women's sports.
5. Stimulating, evaluating and disseminating research in the field of girls and women's sports.
6. Cooperating with allied groups interested in girls and women's sports in order to formulate policies and rules that affect the conduct of women's sports.
7. Providing opportunities for the development of leadership among girls and women for the conduct of their sports programs.

SPORTS GUIDES AND OFFICIAL RULES COMMITTEE INTEREST INDICATOR

The SGOR Committee is endeavoring to broaden its base of personnel and to strengthen its services to *Guide* readers. The purpose of this form is to offer readers an opportunity to join us in meeting this need. Please complete this form and send it to the SGOR Associate Chairman-elect, whose name and address appear on page 16.

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DGWS STATEMENT OF BELIEFS

We believe that opportunities for instruction and participation in sports should be included in the educational experiences of every girl. Sports are an integral part of the culture in which we live. Sports skills and sports participation are valuable social and recreational tools which may be used to enrich the lives of women in our society.

We believe that sports opportunities at all levels of skill should be available to girls and women who wish to take advantage of these experiences. Competition and cooperation may be demonstrated in all sports programs although the type and intensity of the competition will vary with the degree or level of skill of the participants. An understanding of the relationship between competition and cooperation and of how to utilize both within the accepted framework of our society is one of the desirable outcomes of sports participation.

We believe in the importance of physical activity in the maintenance of the general health of the participant.

We believe that participation in sports contributes to the development of self-confidence and to the establishment of desirable interpersonal relations.

For these reasons, *we believe* that girls and women of all ages should be provided with comprehensive school and community programs of sports and recreation. In addition, they should be strongly and actively encouraged to take part in such programs.

PROGRAM

We believe that sports programs for girls and women should be broad, varied, and planned for participants at differing levels of skill. There should be full awareness of the wide span of individual differences so that all types, ages, and skill levels are considered in the planning of sports programs. In conducting the various phases of sports programs, principles must guide action. These principles should be based on the latest and soundest knowledge regarding

1. Growth and development factors
2. Motor learning
3. Social and individual maturation and adjustment
4. The values of sports participation as recognized in our culture.

Elementary Schools (grades 1-6)

We believe in planned, comprehensive, and balanced programs of physical education for every girl in the elementary program. These

should provide experiences in basic movements – for example, skipping and simple dance steps, bending, reaching, and climbing – and in a wide variety of activities which require basic sport skills such as catching, throwing, batting, and kicking.

We believe that intramural sports experiences in appropriately modified sports activities should supplement an instructional program for girls in grades 4, 5, and 6, and that in most cases these experiences will be sufficiently stimulating and competitive for the highly skilled girl. We believe extramural sports activities, if included in the upper elementary grades, should be limited to occasional play days (sports groups or teams composed of representatives from several schools or units), sports days, and invitational events.

Secondary Schools (grades 7-12)

We believe that in secondary schools a program of intramural and extramural participation should be arranged to augment a sound and comprehensive instructional program in physical education for all girls. Extramural programs should be organized to supplement broad instructional and intramural programs provided sufficient time, facilities, and personnel are available for these additional programs.

Colleges and Universities

We believe that college and university instructional programs should go beyond those activities usually included in the high school program. There should be opportunities to explore and develop skills in a variety of activities, with emphasis on individual sports. It is desirable that opportunities for extramural experiences beyond the intramural program be accessible to the highly skilled young women who wish these opportunities.

Forms of Competition

Intramural competition is sports competition in which all participants are identified with the same school, community center, club, organization, institution, or industry, or are residents of a designated small neighborhood or community.

Extramural competition is a plan of sports competition in which participants from two or more schools, community centers, clubs, organizations, institutions, industries, or neighborhoods compete. The forms of extramural competition include

1. Sports days – school or sports group participates as a unit
2. Telegraphic meets – results are compared by wire or mail
3. Invitational events – symposiums, games, or matches to which a school or sports group invites one or more teams or individuals to participate.
4. Interscholastic, intercollegiate, or interagency programs – groups which are trained and coached play a series of scheduled games

and/or tournaments with like teams from other schools, cities, or organizations.

International Competition involves players from different nations and provides sports experiences for individuals or groups with exceptional ability and emotional maturity. This type of competition under some conditions could include secondary school girls, but usually it is planned for more mature participants.

Corecreational activities are designed to give boys and girls opportunities to participate on the same team against a team of like composition, provided the activities do not involve body contact. The basis for formation of teams should be to promote good team play. While positive experiences for the exceptional girl competitor may occur through participation in boys or men's competitive groups, these instances are rare and should be judged acceptable only as an interim procedure for use until girls programs can be initiated.

ADMINISTRATION

We believe that certain *safeguards* should be provided to protect the health and well-being of participants. Adequate health and insurance protection should be secured by the institution. First aid services and emergency medical care should be available during all scheduled interscholastic sports events. Qualified professional leaders should ensure a proper period for conditioning of players, a safe environment including equipment and facilities, a schedule with a limited number of games, and similar measures.

We believe that sports *officiating* should be the responsibility of those who know and use DGWS approved rules. Officials should hold current ratings in those sports in which ratings are given.

We believe that the entire *financing* of girls and women's sports programs should be included in the total school budget. It is suggested that income be handled as a regular school income item.

We believe that the *scheduling* of sports activities for girls and women should be in accordance with their needs and that their schedule should not be required to conform to a league schedule established for boys and men's sports.

We believe that excellence of achievement should be given *recognition* and that the intrinsic values which accrue from the pursuit of excellence are of primary importance. We believe that, when awards are given, they should be inexpensive tokens of a symbolic type, such as ribbons, letters, and small pins.

We believe that expert teaching and quality programs generate their own best *public relations.* It is suggested that an effective plan be developed for interpreting the values of the sports program to parents, teachers in other fields, and interested members of the

school or college community, including the press. A procedure which has proved successful is to invite key groups to a selection of demonstrations and sports events at different levels, so that they may see effective programs in action.

LEADERSHIP

We believe that good leadership is essential to the desirable conduct of the sports program. The qualified leader meets the standards set by the profession, including an understanding of (1) the place and purpose of sports in education, (2) the growth and development of children and youth, (3) the effects of exercise on the human organism, (4) first aid and accident prevention, (5) understanding of specific skills, and (6) sound teaching methods. Personal experience in organized extramural competition is desirable for the young woman planning to become a leader or teacher of women's sports. The leader should demonstrate personal integrity and a primary concern for the welfare of the participant.

POLICY-MAKING

And finally, we believe that all leaders, teachers, and coaches of girls and women's sports should be encouraged to take an active part in the policy decisions which affect planning, organizing, and conducting sports programs for girls and women. Leaders should make sure that qualified women are appointed to the governing sports bodies at all levels – local, state, national, and international – to ensure that programs are in the best interest of those who participate.

STANDARDS IN SPORTS FOR GIRLS AND WOMEN

Standards in sports activities for girls and women should be based upon the following:

1. Sports activities for girls and women should be taught, coached, and officiated by qualified women whenever and wherever possible.
2. Programs should provide every girl with a wide variety of activities.
3. The results of competition should be judged in terms of *benefits to the participants* rather than by the winning of championships or the athletic or commercial advantage to schools or organizations.

Health and Safety Standards for Players

Careful supervision of the health of all players must be provided by—

1. An examination by a qualified physician
2. Written permission by a qualified physician after serious illness or injury
3. Removal of players when they are injured or overfatigued or show signs of emotional instability
4. A healthful, safe, and sanitary environment for sports activity
5. Limitations of competition to a geographical area which will permit players to return at reasonable hours; provision of safe transportation.

General Policies

1. Select the members of all teams so that they play against those of approximately the same ability and maturity.
2. Arrange the schedule of games and practices so as not to place demands on the team or player which would jeopardize the educational objectives of the comprehensive sports program.
3. Discourage any girl from practicing with, or playing with, a team for more than one group while competing in that sport during the same sport season.
4. Promote social events in connection with all forms of competition.

SOURCES OF INFORMATION AND SERVICE

The various services are offered by committees. All requests for information of services should be addressed to the chairman of the committee into whose field of work the inquiry falls. Inquiries which cannot be readily classified should be addressed to the DGWS vice-president.

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**Guide* material prepared by 1971-1973 committee.

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ANSWERS AND RULE REFERENCES*

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1. d FIG Article 1, p. 4; DWGS, Techniques of Officiating Sec. 4
2. c FIG Article 12, p. 13; DGWS Vaults 9.1 and under
3. b FIG Article 12, p. 11; DGWS Vaults, Specific Penalties
4. d FIG Article 12, p. 11; DGWS Vaults, Specific Penalties
5. b FIG Article 13, p. 20; DGWS Penalties Specific To Bars
6. d FIG Article 13, p. 34
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8. b FIG Article 14, p. 53; DGWS Penalties Specific to Balance Beam
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Modern Rhythmic Gymnastics with Rope For High School

ANDREA BODO SCHMID

Andrea Bodo Schmid, DGWS Gymnastics Guide *past chairman, is an associate professor at California State University, San Francisco. She received gold and bronze medals in the 1952 and 1956 Olympic games in team competition with streamer and club. She attended several modern gymnastic clinics, workshops, judges sessions, and international meets held in Europe in the spring of 1972. She has also conducted numerous clinics and workshops and was a member of the teaching staff for the Fifth National Institute on Girls and Women's Sports. Andrea Schmid is coauthor of the books* Gymnastics for Women, *1970, and* Judging and Coaching Women's Gymnastics, *1972.*

Modern rhythmic gymnastics started as an independent competitive feminine sport in Russia in the early 1950s. This new sport, which developed grace, poise, and femininity in the performer, increased in popularity among the Eastern European countries. Modern Rhythmic Gymnastics became recognized as an independent sport by the Federation of International Gymnastics (FIG) in 1963 when the first world championship was held in Budapest, Hungary.

The Eastern European countries, the leaders in this sport, have a TV cup competition every two years to popularize this form of gymnastics. In this meet senior and junior champions of each nation compete. The last meet was held in December 1971, in Hungary. It is interesting to note that all the juniors except one used the rope for their optional routine. It was not coincidental. This indicated that the rope was recognized as one of the most important hand apparatus in the junior programs of all these countries. The rope develops endurance, elasticity, strength, rhythm, coordination, speed, and agility; it is also the best developer of physical fitness, and it is an inexpensive piece of equipment. The rope is also commonly used in the high schools.

Dimensions

The official FIG rope is made from hemp; there is a reinforced central part but no handles. The length of the rope is proportionate to the height of the gymnast. The student stands on the center of

the rope with one foot and hold the ends in her hands. The rope should reach her shoulders.

For school, a sash cord that is ¼ or ½ inch in diameter can be substituted. This rope is good enough to be swung effectively and can change speed quickly. It may be purchased by coil or feet. The rope should be cut in 2 or 3 lengths – for example, 8 and 10 feet – and each length should be taped with a different color.

For easier handling, competitors tie a knot at each end of the rope. This way its length can be adjusted.

Teaching Suggestions

1. The rope can be held with the thumb and index finger, with the other fingers resting on the rope. It should be held loosely, with relaxed wrists so that it rotates in the hands.
2. The rope should not touch the floor but should pass slightly above it.
3. The rope should not touch the trunk or other body part except in movements when the rope is wrapped around the body.
4. The rope should remain tight during the different movements. Rope slack in the course of movement indicates poor technique.
5. Good posture should be emphasized. Body should be erect and not bent during jumps. While jumping, soft knee and ankle action should also be stressed. The feet should remain close to floor and stretched in the air; the knees bend slightly on landing.
6. Because of the strenuous nature of rope jumping, the class should be divided into groups. One group practices while the other observes, or the skills may be alternated; some jumping, then some swinging, and perhaps some balancing exercises with the rope.
7. The exercises should be performed with music at all times. Polkas and other lively folk dance melodies are the most suitable for rope jumping. Even popular music may be used if the rhythm is good.
8. Sequences or combinations should be started as soon as a few skills are learned so that continuity of movement is emphasized from the beginning.
9. Students should be given opportunities to create new sequences. This will help them to discover the limitless possibilities of movements with the rope.

Movements

The rope movements are divided into jumping, swinging, wrapping, balancing, and tossing.

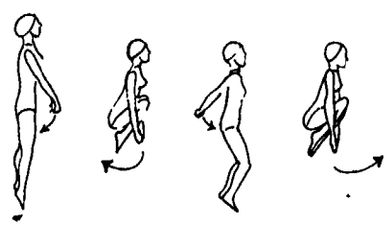
Jumping. The jumps are executed with the rope single, double, or quadruple. The turns of the rope are made forward, backward, or

laterally. The rotation of the rope can be slow (two jumps on each swing), regular (one jump for each turn of rope), and fast (one jump for each double turn of rope). During slow rotation the arms are stretched, in regular turns the arms are bent, and during fast spinning only the wrists rotate.

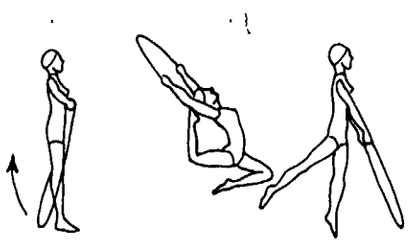
The class should learn plain running steps with forward and backward rope swings before attempting any other skills. The rope may pass under the feet with every third, second, or each running step.

The jumps may be divided into the following categories:

1. Starting with both legs and finishing on both. The best example in this category is basic vertical jump with forward or backward rope turning. This exercise can be performed also with double folded rope.



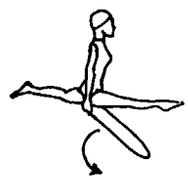
2. Starting on both legs and finishing on one.



3. Starting with one leg and finishing on both.

4. Starting with one leg and finishing on the same leg.

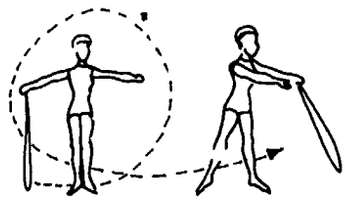
5. Starting on one leg and finishing on the other leg.



Swinging. Swinging skills are also performed with a single, doubled, or quadrupled rope. The rope can be held in one or both hands. The movements are initiated either from the shoulders, elbows, or wrists. Variations and combinations of arm, lower arm, and wrist circles are limitless.

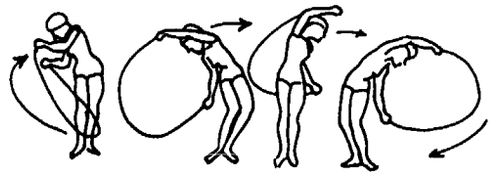
The rope may be swung in vertical, lateral, and horizontal planes. The swing of the rope forward, backward, or sideward should be followed with the total body.

Vertical swings are performed front and back of the body or head.



Lateral swings can be done on the left or right side of the body. The best example is a "figure eight" swing in which the rope circles from side to side.

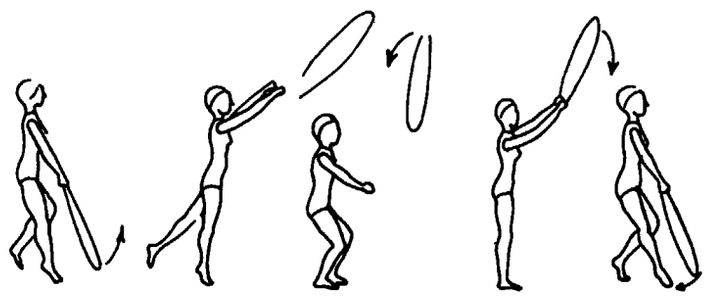
Horizontal swings are executed around the body, above the head, and below the legs.



Wrapping. The rope can be wrapped around any body part. For example, the rope may be wrapped around the waist. The rope is held with the left hand at the waist, and the right hand above the head; the rope is turned with the right hand counterclockwise until it is wrapped around the waist. To unwrap, the rope is turned clockwise with the right hand.

Balancing. Balancing is done with the rope hooked around the leg.

Tossing and Catching. Tossing and catching skills are the most difficult exercises. The rope can be tossed with one or both hands. It can be caught with one or both hands at both ends or with one hand on one end. In many throwing movements the rope is rotated in the air. Tossing and catching skills are usually combined with swinging and jumping movements. A combination of jumping and throwing is given here: turn the rope backward while running or skipping forward. Toss the rope in front above the shoulders and it will make a complete turn in the air; catch the ends of the rope with both hands and continue running forward while turning the rope forward.



Where Do I Start?

LINDA CARPENTER

Linda Carpenter is currently an assistant professor at Brooklyn College, Brooklyn, New York, where she is the women's gymnastics coach. She received her B.S. and M.S. degrees from Brigham Young University, Provo, Utah. Linda Carpenter is a member of the DGWS Gymnastics Guide *committee, holds a current judging rating, and is active in clinics and workshops in the New York area.*

Many of us have had the awesome task of starting to teach or coach gymnastics while being in the unfortunate situation of having too much responsibility and too little knowledge. It seems that there are always many things about an area of specialization which just have to be learned through experience. Some of the ideas presented in this article have been successful for others, and will help you get started without having to wait for "experience" to be the teacher.

Equipment and Budget Problems

The statement has often been made that a quality program is developed more from enthusiasm and willingness to work than from good equipment and facilities. Many skills in all four Olympic gymnastic events can be taught or begun without the specific pieces of apparatus.

Often a beginning program in gymnastics lacks the money for a complete equipment setup. The ideas suggested below are obviously not a substitute for official equipment, but they do at least offer a way of *starting* a gymnastics program while you are waiting for the opportunity to purchase official equipment.

Uneven parallel bars can be simulated by using:

1. Even Parallel Bars–If you don't have the money to buy a conversion kit, remove one rail of the men's parallel bars. A great many skills can be learned or introduced on these "one-rail unevens," such as back and front hip circles, leg circles, seat circles, glide kips, etc.

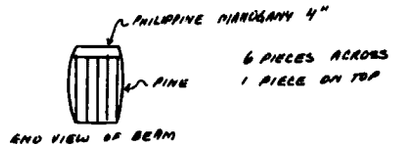
2. Horizontal Bars–Most schools have a horizontal bar for boys. Lower the bar to the height of the unevens' low bar and place it next to the single bar described in suggestion "1" to create a set of uneven bars.

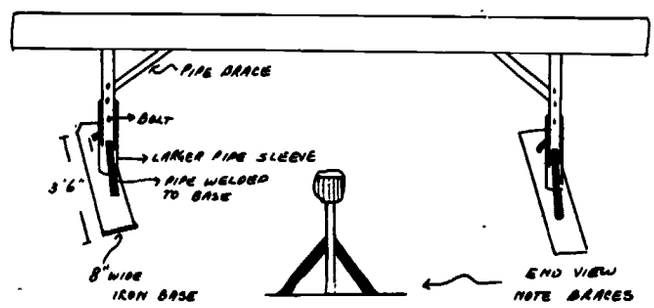
Balance beams can be simulated by using:

1. Floor Beams–Two parallel boards in the gymnasium floor approximate the width of the balance beam, and with a little

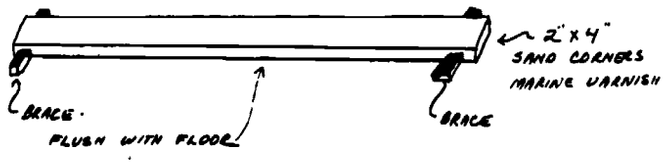
imagination, you will find your students falling "off the floor." Of course, this doesn't work for beam skills which involve hand grasps down the sides of the beam, leg swings, or mounts and dismounts, but while you are waiting for the real thing, time need not be wasted.

2. Homemade Full-Sized Beams[1]: If you are fortunate enough to have a carpentry shop at your school, a full-size balance beam, adjustable in height, can be made for only a small sum.



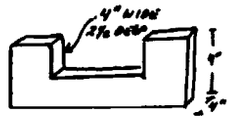


3. Low Practice Beams—If your own carpentry talents must be relied upon, here's another idea.



[1] Thanks to Lella Ogden, Orem, Utah for this design.

Or, if a little money is available, the use of a 4-by 4-inch board (rather than a 2-by 4-inch board) placed on a 4-by 4-inch brace allows for hand grasps beneath the beam.



The edges of all these beams must be well sanded and the surface prepared with a non-slip preparation.

Vaulting apparatus can be simulated by using:

1. Swedish Boxes: These may be a plausible way out of purchasing a more expensive horse at the start of your program. A Swedish box is not not too difficult to build if your budget is low and allows you to begin teaching the elementary and intermediate vaulting techniques.

2. Balance Beams: Another suggestion entails the use of the balance beam with mats draped across it. However, this works only for the very beginning vaults. Safety needs to be a special consideration here, since unless they are secured by other students, the mats may slip. As with all the equipment mentioned in this article, it is only a way of getting started.

SPECIFIC SKILL TECHNIQUES

Once you have either purchased or adapted equipment to your needs, you often face the dilemma of what to teach your girls. An extensive list of reference materials is given on page 134 of this *Guide*, and the National Committee can supply the names of people in your area who are willing to help you get started by aiding with clinics, local events of interest, etc.

Attendance at the very successful and valuable annual gymnastics clinics is of great benefit to the new and experienced coach alike. Clinics are usually available during Christmas and summer vacations.

BUILDING GYMNASTS

Most coaches consulted in the preparation of this article seemed to feel that there is a point reached when the *members* of a new gymnastics program become individual *gymnasts.* The incorporation of complete routines, even rudimentary ones, as soon as possible helps to speed the process of building gymnasts. Any type of routine is difficult for the beginner to learn, but compulsories at least establish a pattern and help solve the problem of self-consciousness. It also obligates the gymnast to establish a repertoire of basic movements which would often go ignored in favor of the generally more interesting optional work.

The new coach should bring a system of organization to the practice session. This is not meant to indicate that she must have set warm-ups or a prescribed time for compulsories. However, she must bring her girls to the realization that they must learn to spend their time well. The gymnast must understand the needs of gymnastics as they apply to her. When this happens, she becomes a gymnast.

The experience gained from participation in some type of competition is generally both an incentive and a boost to the gymnast's appetite for work. The impending date of a meet crystalizes routines and helps to point out specific areas needing work. The gymnast also seems more capable of intense practice. The coach who understands these changes and uses them to advantage can help her gymnasts grow a great deal in a very short time.

However, avoid the trap of asking your girls to do things beyond their skill or conditioning level. Don't let schedule or other demands convince you to let a girl try a trick which she hasn't mastered in competition. An injury is not worth the 1.0 difficulty. If for some reason the coach feels the need to include such a move in competition, it is wise to remember that the 1.5 deduction for spotting is expensive, but it is a small price to pay to prevent injury. If you decide to spot a gymnast in competition, you should remember there is no reduction in the spotting penalty for a light spot, so you might as well get your "penalty's worth" and make sure the girl is safe.

Some coaches take position to spot with no intention of spotting, thus giving the girl a false sense of security. This is unfair to the girl. In addition, it has often seemed that the presence of a spotter tells the judges that the gymnast is unsure of her routine. A coach of a beginning team must be sure to evaluate her intentions and goals in

relationship to the gymnast's needs for success, security, skill, and safety.

The following capsulized list may supply some specific ideas which may help you.

1. A well-planned conditioning program will enable the girls to be ready with the strength, flexibility, and endurance as more difficult stunts are introduced.
2. A conditioning program at home can save gymnasium time for actual practice.
3. Videotape, movies, or even still photographs are valuable aids and help improve execution.
4. A large group learning the basics provides a good source of gymnasts.
5. Don't give up on the "not innately skilled girls"; they often work harder.
6. Community, school, and parent support helps encourage your girls.
7. Mutual workouts or scrimmages before a meet help to decrease nervousness.
8. Clinics, movies of competitions, judging, and rules sessions all add to your gymnast's understanding.
9. Teach spotting as well as stunts. The coach can't be everywhere at once. Often the mechanics of a movement are learned through spotting a teammate. Team spirit grows, too.
10. Combine moves as soon as possible, even two together.
11. Remove spotting as soon as it is safe to do so.
12. A wise and carefully thought-out compromise between insisting on excellent form before going on to advanced moves and poor, haphazard habits must be considered.
13. Return to the very basic moves now and then for form practice and an ego boost. Stress amplitude.
14. Review your goals and your progress toward them frequently in light of your own situation.

A few of the many things needed by the new gymnastics coach include:

1. Hard work
2. A willingness to learn on the part of both gymnast and coach
3. A never-ending search and hunger for more gymnastics information
4. A realization that what works for one group may not work without modification for your group
5. An understanding of your goals
6. An evaluation of your group's needs in relation to competition and/or recreational gymnastics.

Circuit Conditioning for Gymnastics

TRUDY YOUNGER

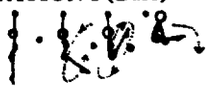
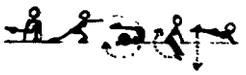
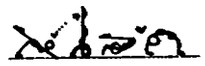
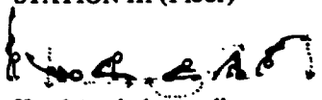
Trudy Younger is an instructor in the Jefferson County School System at Lakewood, Colorado. She received her B.S. degree from the University of Northern Colorado, and is completing her M.A. degree in dance and the related arts. She has served as Colorado's dance chairman and as the DGWS state gymnastic chairman.

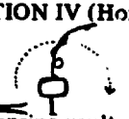
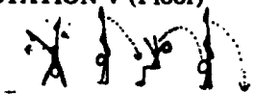
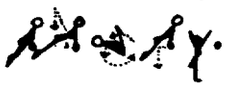
Few other sports for women make as many demands on the human body as gymnastics. It is vital, therefore, that the body of a gymnast possess the qualities of strength, flexibility, and endurance. Circuit training, as a method of conditioning gymnasts, can develop these qualities adequately through the performance of selected gymnastic activities.

The term "gymnastic circuit" refers to a number of carefully selected gymnastic exercises arranged and numbered consecutively about a given area. Each numbered exercise within the circuit is referred to as a "station" and a prescribed amount of work is performed at each. The performer progresses from station to station until the circuit is completed.

The exercises included within the gymnastic circuit should be designed to stimulate a willingness to engage in activities that will contribute toward the attainment of a specific level of gymnastic skill. The following suggestions of beginning, intermediate, and advanced circuits were designed to challenge, not overwhelm, a general physical education class. The purpose of the circuit is to condition the body through specific gymnastic exercises and basic skills. All circuits should be supplemented with warm-up exercises and should offer opportunities for enhancement of cardiovascular endurance through jogging, jumping rope, or practice in locomotor steps.

Circuit Conditioning for Gymnastics

Beginning	Intermediate	Advanced
STATION I (Bars) 	STATION I (Bars) 	STATION 1 (Bars) 
Long hang mount Straddle over low bar 3 double leg lifts Pike shoot off dismount	Long hang mount 2 double leg circles right 2 double leg circles left Pike shoot off dismount	Long hang mount Alternate chin-up and double leg circle 2 right 2 left Pike shoot off dismount
STATION II (Beam) 	STATION II (Beam) 	STATION II (Beam) 
Crotch seat mount V sit Pretzel bend Flank dismount	Wolf mount Turn to lunge Forward roll Flank dismount	Straddle aerial mount turn to crotch seat Backward roll Swing to forward roll Flank dismount
STATION III (Floor) 	STATION III (Floor) 	STATION III (Floor) 
Swedish drop Pike headstand Roll forward Kip to bridge	Handstand chest roll Stoop through Hip circle to Pike headspring	Back extension Back walkover Tours jete

STATION IV (Horse)	**STATION IV (Horse)**	**STATION IV (Horse)**
		
5 hip lifts	Wolf vault	Handspring vault
STATION V (Floor)	**STATION V (Floor)**	**STATION V (Floor)**
		
Pike forward roll, walkout Cartwheel Scissor handstand	One hand cartwheel Cartwheel Front Handspring	Roundoff Back Handspring
STATION VI (Bars)	**STATION VI (Bars)**	**STATION VI (Bars)**
		
Straight arm support mount Back hip circle Cast off dismount	Back pullover mount Single leg shoot through Mill circle Rear leg cut forward Pike shoot off dismount	Glide kip mount Front hip circle Cast off ½ twist dismount

Common Lower Leg Injuries, Care and Prevention

LEWIS CROWL
BARBARA PARCHER

Lewis Crowl is a certified trainer and physical therapist. He received his physical therapy certification, B.S. and M.S. degrees at Ohio State University, Columbus. He has conducted numerous workshops and clinics related to athletic training. Lewis Crowl was selected as the United States Olympic Trainer for the 1968 Summer Games and the 1972 Winter Games. He served as trainer for the National AAU Track and Field Meet in 1968 and the U.S.–Russia Junior Track and Field Meet in 1972.

Barbara Parcher received her B.A. degree from Sacramento State College, Sacramento, California. She was selected as an All American Gymnast in 1969 and 1970 and was a member of the USA Gymnastics Team traveling to the Middle East in 1969. She was All-Around Champion at the DGWS Intercollegiate Championship in 1970 and the California State and Regional Champion in 1971. Miss Parcher is currently teaching and coaching at the John F. Kennedy High School in Sacramento, California.

Lower leg injuries present a very real and serious problem to gymnasts. Competitions at all levels have been lost or seriously hindered by lower leg injuries.

INJURIES

The term shin splint is really a "garbage term," in that many coaches and instructors name all injuries to the lower leg shin splints. It has been found that other, sometimes very serious, injuries occur to the lower leg that do not fall into that rather common category. Two of the most common injuries are stress fractures and anterior compartment syndrome.

RECOGNIZING THE DIFFERENCE

Shin Splint. Through evaluating research, related literature, and experience, we believe that only those injuries occuring to the lower posterior medial two thirds of the tibia should be called shin splints. They occur most commonly in events such as vaulting and tumbling where the athletes run and jump on hard surfaces. One theory is that

constant jarring of the metatarsal portion of the foot causes a bruising irritation to the insertion of the plantar flexion muscles of the lower leg and foot. The irritation leads directly to a myositis, tenosynovitis, and periostitis of the tibia and muscles of the posterior compartment attachments.

A symptom of this injury is pain on the posterior and medial border of the tibia along the lower two thirds of the bone. The pain is severe at times and is usually sensitive to direct pressure in the areas of muscular attachment. Many athletes will state that the pain is so severe that it is difficult to walk, let alone compete.

Stress Fracture. A stress fracture, or fatigue, is usually a result of repeated stress to a bone beyond the bone's tolerance for stress. A stress fracture is often extremely hard to diagnose as there may not be any fracture line present, and one may not be visible radiologically for as long as three months.

The symptoms of a stress fracture are very similar to those of the shin splint, except that the pain will be right on the shaft of the tibia or fibula. We have found through experience that this pain is usually confined to one small area of the bone and is very sensitive to pressure applied directly on the location. Another very interesting symptom and completely different from that of a shin splint is that there will usually be pain on indirect pressure. This is demonstrated by applying mild pressure above or below the painful area. If pain is still elicited in the one localized area, a stress fracture may be suspected.

Anterior Compartment Syndrome. The anterior compartment is the muscular area of the lower leg that is lateral to the tibia. The most anterior muscle is the anterior tibial, with the extensor digitorum longus just adjacent and posterior. Also running through this area are the anterior tibial artery and the anterior tibial nerve. Swelling as a result of muscular exertion causes pressure to these structures producing loss of muscle power to the foot, numbness, and loss of circulation. Any indication of these symptoms should not be taken lightly. They definitely deserve medical attention.

TREATMENT

Very little time will be devoted to treatment of those injuries mentioned earlier, as in most cases the team physician and trainer involved should be in charge of the treatment plan. Early first aid treatment should always include the use of ice and elevation to help relieve the swelling and spasms of the muscles and soft tissues. Heat, such as whirlpool and hot packs, should not be used in the early stages. Rest from the particular activities that are causing the problem is very definitely in order, and when returning to these

activities precaution should be taken not to resume full activity too soon.

PREVENTION

Emphasis should be placed in the area of prevention. Many of the injuries discussed earlier are a result of weak arches and can be prevented by proper equipment, protective padding, and conditioning.

To strengthen the arches, the gymnast should place a towel under the feet and gather it with the toes toward the heel; also, picking up small objects with the toes such as marbles and pencils will develop strength. Running builds strength and endurance. The gymnast should begin slowly, about an eighth of a mile at a time, then gradually build to one mile. Instead of increasing distance, gymnasts should work to improve running technique, and to shorten their time. When running, the feet should be well supported with shoes, felt pads, and arch taping, if necessary. Good running technique, practiced daily, will be an asset to vaulting. The following suggestions are for protecting the legs during practice; some are also applicable to competition.

Vaulting. The feet should be supported when vaulting. Felt pads for absorbing shock and decreasing stress (figure 1), arch taping (figure 2), and shoes should be worn.

The board should also be padded; a half inch pad will absorb shock but will not interfere with the vault. The vaulting runway should be padded; some type of carpeting may be available, if not, tumbling mats can be lined up end to end.

Landings deserve much consideration; a four-inch mat or tumbling mats stacked upon each other can be used. It is important that the landing surface be soft, but firm and smooth to avoid the possibility of twisting ankles or knees.

Floor Exercise. The feet deserve the same consideration in floor exercise as they do in vaulting. When performing on the floor, mats should be placed where tumbling stunts and strenuous rebounding dance is to be executed.

Balance Beam. Pads on the feet are not practical for the beam, but arch taping is excellent : it offers firm support as well as freedom to work in bare feet. If a gymnast has sore shins, it is unwise to do beam work; the dance work performed high on the toes places strain upon the legs. When several mounts are being practiced, the board should be padded. The landing surface must be equal to that used for vaulting. If paneled folding mats are being used, turning them upside down will prevent catching toes in cracks which is especially important to avoid on twisting dismounts.

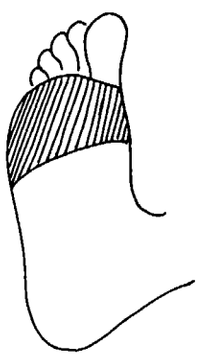


Figure 1.

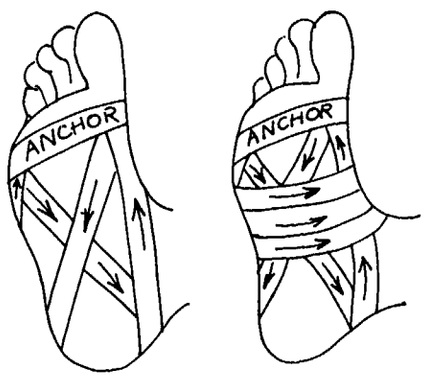


Figure 2.

Uneven Bars. All suggestions considered under mounts and dismounts on the beam are important when training on the uneven bars.

TRAINING SCHEDULE

When trying to prevent injuries from excessive strain, a training schedule is of utmost importance. Teams at all levels should have a schedule–more work can be accomplished, and injuries can be prevented. Instead of having the gymnast work a single event or stunt many times in one practice session, construct a schedule whereby the athletes work a little on each event each day. Several short periods of time spent on a skill will produce better results in terms of learning, and stress injuries can be kept to a minimum. Concentrating on one movement for a long period of time may cause the gymnast to miss practice entirely as a result of muscle strain and injury. If possible, have one day in the middle of the weekly training schedule where the legs get a rest from intense pounding. On this day the gymnasts can concentrate on balance beam, uneven bars, dance combinations (but not the rebounding type) and flexibility tumbling stunts. It is particularly important to begin slowly and gradually build to more strenuous workouts later in the season. After vacations a lighter schedule to start again will also help avoid injuries. Just as participation is the key to satisfaction and success in sports, so care and prevention of injuries are the keys to participation.

In Search of Good Gymnastic Music

PATRICIA MELCHER BISSELL

Patricia Melcher Bissell received her B.S. degree in Music (Piano and Composition) from Peabody Conservatory, Baltimore, Maryland, and her M.S. degree in Music (Composition) from Yale University, Hartford, Connecticut. She was a Fulbright Scholar in Musical Composition in Paris. Patricia Bissell was the pianist for the Women's Gymnastic Team in the 1968 Olympics in Mexico City, and the arranger of the music for compulsory floor exercise for the Women's Gymnastic Team in the 1972 Olympics in Munich. She composed and arranged the music for Gymnastics with Muriel Grossfeld, *Kimbo Record Compan.*.

As pianist for the 1968 Women's Gymnastic Olympic Team in Mexico City, I began to question the suitability of the musical arrangements used for gymnastics. After five years of searching and attempting to develop a more suitable style of music with Muriel Grossfeld, I was able to summarize my experience in the arrangement of "Summer of '42" which was used for the compulsory floor exercise by the 1972 Women's Gymnastic Olympic Team. This musical arrangement had to be flexible enough to serve six totally different gymnasts. The sections from beginning to end included: (1) an introduction of the theme followed by a quick and strong repetition for tumbling; (2) a waltz rhythm under the theme leading to a handspring and cartwheel; (3) a slow but flowing statement of theme to underline a back walkover; (4) a strong and firm march rhythm under the theme to emphasize a full turn, continuing with a faster and brighter rhythmic statement of the theme for a leap, and a sudden soft contrast for an arabesque; and finally, (5) a strong statement of the theme, varied from the introductory statement for tumbling, ending with a lighter thematic statement reminiscent of the beginning. In essence, the direct, easily understood and yet contrasting musical line enhanced the elements of the compulsory floor exercise, helping to combine each girl's movements into a smooth presentation. I would like to share with you some of my observations of the past five years in selecting and arranging music for floor exercise. I hope that such observations will be helpful. I give consideration to four factors in composing gymnastic music.

The Duration Factor

Because of the time limit – maximum 90 seconds – the arrangement should be built around one melody. The style of this

melody must enhance the best qualities of the gymnast's performance and personality for this short period of time. Medleys of tunes are too often a "mish-mash." If two or more melodies are used, they must be complimentary or related structurally. For example, two strong or similar melodies can cancel each other out; on the other hand, totally unrelated melodies can create confusion.

The Acoustic Factor

Consider that you are in a gymnasium, not a concert hall. With inferior pianos to play, the difficulties of recording and reproducing the piano on tape, noisy audiences, or two or more events going on at the same time, the music must be so melodically and rhythmically clear that it is easily comprehended by the gymnast, the judges, and members of the audience sitting anywhere in the gym. Good "gymnastic melodies" can be found in popular, folk, or classical music. To test the suitability of the music for gymnastics, first listen to the melody only, without the accompaniment. Some melodies may sound well as a piano solo, while others depend on an orchestra, words, or a particular singer. Then consider the strength and clarity of the rhythmic patterns in both the melody and the accompaniment. Ask yourself, "how well will this melody and rhythm sound on a piano in the gymnasium?"

The Contrast Factor

Contrast in the music helps to overcome the duration and acoustic factors while emphasizing the gymnast's movements. Contrast can be achieved by changes in register, volume, or rhythm. Try developing your arrangements with the melody in different registers. Melodies played in the higher registers are most audible. Melodies in the middle registers are often more effective with the melody doubled in higher or lower octaves. Use caution with the bass registers. The bass registers can be used to contrast with or support higher register melodies or chords or as a drum effect. Fast notes in a low register are often wasted sound in a gymnasium. The arrangement should provide for changes in volume to emphasize particular movements of the gymnast. Try developing the arrangement by changing the basic beat in different sections – for example, from a waltz to a march rhythm. Other rhythmic changes such as acceleration or retardation of the melody can create effective contrast. Arrange chords to underline the basic beat structure and significant rhythmic changes.

The Coordination Factor

After considering the duration, acoustics, and contrast factors, consider the problem of combining the music with the gymnasts'

movements. Having selected an appropriate melody for your gymnast, arrange each musical phrase to coordinate with the different sections of movement, particularly the beginnings and endings of such sections. For example, given a musical phrase that starts a tumbling run, the melody should not stop in the middle, but at the end of that series of movements, thus eliminating "fill-in" or irrelevant sounds which only weaken the feeling of continuity. Experiment by slowing, speeding, adding small extensions, shifting accents, or using silence to achieve this result. As each section of movement changes, so must the music show contrast in register, rhythm, or volume. The total effectiveness of the coordination of the music and movement is determined by the suitability of the melody and style of music in relation to the gymnast, the coherency of the music within itself, and the balance of contrast achieved between the sections of movement and its accompanying music.

Strive for complete musicality, not just a high note for a pose or fast notes for tumbling, but a coherent musical line which might be extended or sustained but never broken or confusing. Such a strong organization and clear identification of line is essential for a quality floor exercise that will motivate the gymnast in daily workouts, be remembered and enjoyed by the gymnast, judge, and audience, and of course, will achieve a good score.

Avoiding Monotonous Beam Routines

MARGIT TREIBER

Margit Treiber is an assistant professor at Indiana State University and currently coaches the ISU gymnastics team. She received her professional training in Budapest, Hungary, at the Hungarian Physical Education Academy and her M.S. degree at Indiana State University. She has competed, coached, and judged gymnastics in Budapest. She served as the coach for the USA Women's Gymnastics Team for the 1970 World University Games in Italy and was manager for the USA Women's Gymnastics Team to the Pan-American Games in 1971. Margit Treiber is a member of the Women's Technical Committee for USGF and served as a member of the 1972 United States Olympic Committee for Women's Gymnastics.

Of the four international gymnastics events, the balance beam routine is the most difficult to choreograph interestingly and perform successfully. The special limitations of the 5m(16.4') by 10cm (3.9") by 120cm (3.9') beam often produce monotonous, jerky, spasmodically executed routines without the slightest excitement in design.

The past four years have brought much risk to the elite level of performance with adaptations in such tumbling moves as dive cartwheels, back handsprings, aerials, and somersaults. Formerly, these were used primarily as dismounts. However, even if one of these highly difficult moves is added to the other required components, the composition may still be uninteresting as a whole. Thus, the aim of this article is to give suggestions for making the balance beam performance more exciting to watch.

Nonstop Performance. The gymnast should be in constant motion at all times, except for the three stops allowed. Like a streamer in the hand, a modern gymnast should move constantly with varied dynamics, rhythms, tempos, and paths in space. Considering that the usual routine will include some type of handstand, split, or scale (balance movements which are counted as definite stops) the so-called "poses" used so frequently must be executed without stops by moving through them with as much articulation as possible.

A nonstop routine is fascinating and exciting to watch. Frequent stops for poses are of little interest to the viewer.

Punch Lines. Several dynamic or sustained movements in a routine will give color and break the monotony. For example, to end a sequence the arms, legs or head can execute the very last movement with vitality, sharpness, or contrasting slow, sustained movements.

Using the total body in a dynamic or contrasting manner will give exceptional interest. Turns executed sharply with a high-speed spin of 360° or more will add spark to the performance. Another type of movement which is considered a requisite but may be used effectively as a "punch line" is the body wave. A wave may begin with slow and sustained motion and develop into strong, forceful movement, or two body waves may be connected–one upward and the other sideward–and used with contrasting efforts.

Inverted Moves. Combinations of walkovers, handstands, cartwheels, etc., should be scattered throughout the routine. Two passages of this type should be separated by a passage in which the gymnast works on her feet with dance movements. Too many inversions become tiring and are not aesthetically appealing to the viewers.

The Use of the Five Meters. Every pass should not utilize the full length of the beam. Moving only 1/3, 1/2, or 3/4 of the distance in the course of a performance will break up the pendulum effect of the space pattern. This approach may be used effectively once or twice in a routine.

Turns and jumps should be varied in their placement within the routine and on the beam. Avoid using them only to change direction upon reaching the end of the beam.

If the sequence utilizes the full length of the beam, the last movement should take place at the extreme end of the beam and not leave five or six inches unused. Precise spacing enhances the performance, showing discipline, risk, and a well-designed sequence.

Well-selected moves executed on the end of the beam with the performer facing outward add dimension and interest to the routine–for example: scales, turns, and kicks.

Set-up Important Moves. Whatever the important move may be–a giant split leap, a back handspring, a dive cartwheel, – the preceding movement should be selected to complement the upcoming move. This can be accomplished by using contrast in tempo, level, rhythm, or dynamics.

For example, both a dive cartwheel and a back handspring are quick, dynamic, and airy downward motions. For contrast, the previous sequence should move more slowly, be soft in quality, and possibly focus upward. If similar kinds of movements succeed each other, one will weaken the next.

The sequel to an important move should be given the same consideration for effect. After a leap, for example, land low to complement the height of the leap.

Rhythm–Tempo. If a routine is performed fluently but without enough change of rhythm and tempo, it becomes mechanical and appears to drag. A good routine will include variations of slow and quick movements used in alternate rhythmical patterns (example for rhythm: 1-2-3, 1-2, 1-2). Variations of tempo may be accomplished through dance steps or by the movement of a body part such as the head, trunk, arm, or leg.

A few example combinations are:

Cartwheel (lively);	1-2-3-4
Slide step with plie and body wave (sustained):	1-2-3
Step 360° turn (sharp):	1-2
Lunge to split:	1-2-3-4-5

Forearm circles in front of body (1-2-3-4)

Repeat arm circle fast, finishing it with a thrust over the head (5).

Focus. Many turns, leaps, and acrobatic movements require the gymnast to focus on the end of the beam to obtain maximum coordination and control. Therefore, special effort should be made to design movements which are focused sideward or on the oblique lines. The gymnast may think in terms of focusing "around the clock" rather than north and south. This gives a refreshing variety, a feeling of freedom in space, and provides an opportunity for self-projection.

When looking out on a diagonal or sideward movement, the gymnast should look far out into the distance. This gives contact with the entire audience in that direction. To constantly look down to the ends of the beam during a routine makes the gymnast appear timid, tense, and wrapped up with herself. A performance of this type cannot hold the interest of the audience or judges very long.

Elegance. When the base is narrow, balance becomes more delicate and elegant, thereby creating a more exciting shape in space – Compare a Grecian vase base and a pyramid.

The gymnast should execute as many steps as possible on the "needle point" (heel kept high and the sole of the foot close to the vertical line). Flat-footed work, such as turns, is not only penalized, but also appears heavy, lacks risk, and is unexciting.

Working on the "needle point" makes the body appear narrower because of the additional inches in height. To increase the effect, the free leg also should be used with high elevation – forward, backward, or sideward. Films of Olympic finalists projected at high speed show that approximately 90% of each routine contains movements in which the legs are separated to a maximum degree in standing as well as inverted positions.

Relaxation. It is tiring to view performances in which one movement never comes to completion before the next movement is originated, i.e., where there is not enough relaxation between efforts. Just as an oarsman strokes and relaxes alternately, a gymnast should have qualities of completion and relaxation in every gymnastics movement. Because of the narrow base and height of the beam surface, the gymnast tends to lose these qualities more frequently in performing on the balance beam than in the other events.

It is true that in most beam movements a locked scapulae and locked hips are desirable to insure proper body alignment. However, this should not mean that movements of the arms and legs should be limited in range and executed with stiffness. The gymnast usually lacks relaxation in the downward phase of actions. To correct this, the gymnast should emphasize the principle of giving in to gravity to initiate a new movement with the arms and legs or the trunk and head.

Originality. This should be the highlight of each routine. Originality should be immediately apparent in the mount, and call attention to the performer. Work for originality even if the move is not classified as extremely difficult.

Incorporating falls, slides, rolls, and jumps with unusual starting and finishing positions provides numerous and inexhaustible possibilities. Turns originating or ending on a diagonal axis are exceptionally interesting. Turns executed with change of level are always effective. Jumps showing two positions in the air (tuck and arabesque) are not only unique in appearance but raise the level of difficulty for that particular skill.

To evaluate the composition of a beam routine after the content is established, check for the following:

1. Does it show logic in connections and fluency for execution?
2. Is the gymnast satisfied with the content of the routine and does it feel good to her?
3. Are the movements designed to allow alternation between effort and relaxation?
4. Does the routine show contrast in tempo, rhythm, level, line, and dynamics?
5. Does the composition reflect individuality, originality, femininity, and beauty?

The ultimate accomplishment, an exciting, artistic, and faultless performance, the coach and the gymnast need to consider the criteria listed above as well as tricks and rules.

Teaching the Full-Twisting Back Somersault

TOM PROULX

Tom Proulx has attended Pasadena City College and Colorado State University. He has been the national champion in tumbling and floor exercise. He is currently the tumbling coach for the Long Beach SCATS.

Before the full-twisting back somersault can be taught, the teacher must make sure the student has a good straight layout (not arched) somersault. A good layout will insure that the full twist can be completed without any extra movements, thereby helping to eliminate bad habits during the learning process.

Teaching the Full Twist

The twist should start when the body reaches an approximate 45° angle on the way up with the toes up and the head down. To reach this point, the arm lift should be the same as in a tuck back somersault, and on the takeoff the hips should be thrust straight up. This will give the tumbler proper rotation and lift. At this point the twist is started. The body is held rigid. The head leads in the direction of the twist, the leading arm pulls, and the trailing arm swings in, all at the same time. On the lift the tumbler should see straight ahead and shift up. She should see the ground at all times during the twist and landing. If this procedure is followed, the landing will take care of itself. The somersault and twist should be completed when the body reaches approximately 45° angle on the way down with the toes up and the head down. Coming out of the twist and into the landing, the legs and knees should be kept firm but not stiff and the head should be up.

Spotting the Full Twist

For better control of incorrect movements, I prefer hand spotting to the use of a twisting belt. When hand spotting, if the tumbler twists to the left, swinging with the right arm, the spotter should stand on the tumbler's right. (The first part of the twist goes away from the spotter, the second half comes in.) In this position the spotter can be in complete contact all or part of the time, depending on the tumbler's ability. If the tumbler twists to the right, spotting is just the opposite, with the spotter standing to the tumbler's left.

When the tumbler "punches," the right hand of the spotter should be on the tumbler's left hip, palm up, with the left palm on

the tumbler's right hip. The spotter should follow the lift and rotation in this position until the tumbler's body reaches 45°. The spotter should then pull with her right hand and push with left, rolling the tumbler onto her left arm. The spotter's right hand ends up on the tumbler's back for an overspin. If the spotter is in close, she does not need much strength, even for a large tumbler. In the event of a complete miss on the tumbler's part, most of the weight lands on the spotter's shoulder, not out at arm's length.

Many coaches and spotters spot the full twist from the other side with the first half of the twist going into the spotter. This is an effective way of spotting, but it tends to cause the performer to twist too early, which is a very difficult habit to break. The tumbler in most cases will tend to tumble towards the spotter, hence twisting off the ground, but if the spotter is on the other side, she tends to keep the tumbler waiting for the twist.

Checkpoints For Coaching and Judging the Handspring and Yamashita Vault

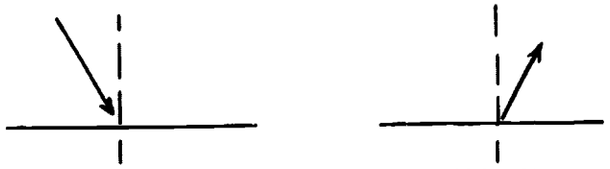
DALE FLANSAAS

Dale Flansaas is a graduate of the University of Washington, Seattle. She competed on national gymnastics teams from 1962 to 1966, including the 1962 and 1966 World Games Teams, the 1963 Pan American Games Team, and the 1964 Olympic Team. In 1968 she served as technical chairman for AAU and was an Olympic judge for the United States. She has conducted numerous clinics and workshops throughout the United States. She has been the Women's National Gymnastics coach and served as manager for the United States Women's Olympic Gymnastics Team in 1972.

To execute both the handspring and Yamashita vault, the gymnast must run hard. A strong, powerful run is necessary to develop the speed essential for these vaults. The run should start out hard and increase in speed all the way to the takeoff point. The most common mistake is for the gymnast to slow down slightly just before the hurdle.

The hurdle itself is low, and the body is behind the vertical during the hurdle. The arms are preparing for extension during this phase. Gymnasts use various types of arm movements. If a girl has natural vaulting ability, she can usually use any method of arm thrust. However, the most popular method is to circle the arms outward in a small backward circle and then bring the arms bent in front of the body, thrusting to the vertical extension. With the body coiled like a spring and the knees slightly bent, the gymnast contacts the board on the balls of the feet.

Slightly after takeoff, the body extends ideally to a straight body position. If the angle of takeoff is correct, an excellent vault may result. Following is an example of the correct angles.

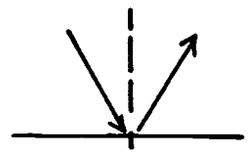


Contact on Board
Behind the vertical.

Takeoff
Slightly in front of the vertical.

Handspring Vault

The angle of contact on the horse should be appproximately 45°. Lower than this is unacceptable. If the gymnast's preflight is too close to the vertical, a low afterflight usually results. The gymnast must judge her angle according to the amount of strength she has in the shoulder girdle for push-off. The body should be stretched on contact. The support is very quick, with the shoulders giving a quick shrug and the fingertips giving the final push. The angle of push-off should be higher than the angle of contact.

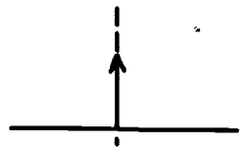


Pre-flight. Afterflight.

The afterflight also should show a straight body position as well as the same balance as the preflight, or higher. If the gymnast can maintain her body position without piking or arching, her body will follow the path outlined on the angle of push-off from the horse.

When preparing for the landing, the angle of the body should be slightly behind the vertical. The knees bend on contact, and then the body stretches to the vertical position. Momentum will carry the body to the vertical.

Preparation.



Landing.

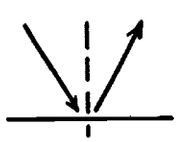
The main checkpoints for coaching and judging a handspring vault are:

1. Strong run
2. Body behind vertical on board contact
3. Straight body extension on preflight
4. Heels lifted slightly after takeoff
5. Shoulders shrugged and push off on contact
6. Straight body position maintained on afterflight
7. Body behind vertical in preparing for the landing.

Many times the gymnast is weak in a certain phase of the vault, so the coach should concentrate on that phase. The run and takeoff can be practiced using only the board, with the concentration on angles. Sometimes the girl will need some preflight spotting to develop her angle. Usually the weakest phase is the push-off to the landing. The spotter can assist the gymnast by spotting the upper arm and upper back and by helping her feel the quickness of the push-off and maintain position to the landing. The most important phase of the vault is the afterflight so it needs the most attention. Jumping from the middle of a trampoline to the hands on the edge of the tramp and pushing off to a landing is one of the best methods of practicing push-off without vaulting. There are many drills which develop various phases of the vault. However, one should be careful not to rely on them completely. Vaulting is the only way to develop good vaulting; drills are just an aid.

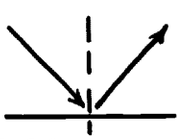
When judging vaulting, one must judge as a whole the preflight and afterflight areas, push-off, direction, landing, and body position and stretch. The judge must thoroughly understand vault techniques as described above. She must be very aware of angles, especially noticing the high points of the preflight and afterflight and the angle of contact and push-off from the horse. These points tell what happens to the vault. Generally, vaults can be placed in the following categories:

9.5 +



Arrive on horse at 45° or above. Higher afterflight. Straight body position maintained. Push-off quick.

9.0 - 9.5

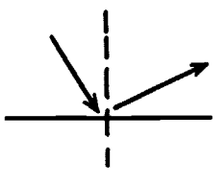


45° on and 45° off. Push-off a little slow. Straight body position maintained.

8.5 - 9.0

One phase of the vault is too low. Low on and high off.

or

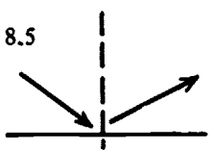


High on and low off.

Push-off slow.

Vault still flighty, however.

8.0 - 8.5



Both phases of the vault a little low, but vault still moving quickly over the horse.

Push-off slow.

Body position on one phase could be poor.

7.9 or below

Other things besides poor flight:

–Body position (arched or piked)

–Bent arms

–Body not at vertical (shoulder in front of body)

–Landings poor

–Form

Naturally the judge must take deductions, but if she can generally see these faults immediately, her deductions should result in totals that fit into these ranges.

Another judging aid is to draw the vaulter's angles as soon as the girl vaults and deduct immediately. For example, a girl vaults and comes onto the horse slightly below 45°, the push-off is slow; she arches and lands with one step.

Preflight – .4
Push-off slow. – .3

Body arched	– .3
Afterflight	– .8
Landing	– .1
	– 1.9 deductions

Vault 8.1

Yamashita Vault

A good handspring is a prerequisite to the Yamashita vault. The gymnast must know how to control each phase of the vault. The run and takeoff are the same as for the handspring.

The difference in technique starts as the body is allowed to pike slightly, just before contact or at the time of the hand contact. As the push-off is executed, the body pikes deeply (not higher than 45°). The back of the gymnast should be parallel to the floor. The hips and body should rise after the push-off. At the height of the afterflight, the body opens up quickly (legs kick out) to a straight body position. The body is still parallel to the floor. The body prepares for landing as the feet are forced downward and the head and shoulders come forward. The landing is the same as for the handspring. The main checkpoints a judge should look for are:

1. Afterflight higher than preflight
2. Slight pike before or at hand contact
3. Deep pike on push-off – back parallel to the floor
4. Open up parallel to the floor.
5. Landing behind the vertical

For the judge, the generalized categories for the handspring also apply here, plus the following deductions specific to this vault:

Low and late execution of the deep pike	up to 0.5
Hips do not rise in afterflight	0.5
Lateness of extension in afterflight	up to 0.5
Insufficient opening up in afterflight	up to 2.0
Short afterflight (balance ot flights)	up to 0.3

The following is an example of judging a ,amashita vault: The gymnast vaults onto the horse at 45°; the push-off is slow; hips fail to rise; vaulter opens up as she is landing; landing is satisfactory.

Preflight	– O.K.
Push-off slow	– .3
Afterflight	– .8
Pike–hips fail to rise	– .5
Open down	– .8
	2.4 deductions

Vault 7.6

Two Superior Moves on the Uneven Bars

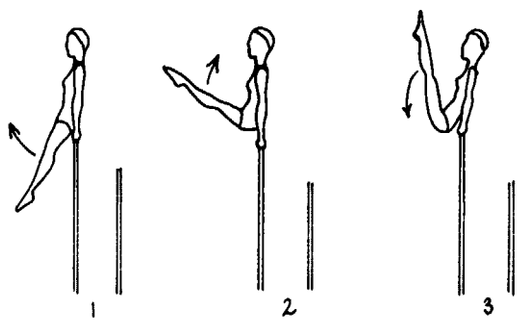
CLEO ANN CARVER

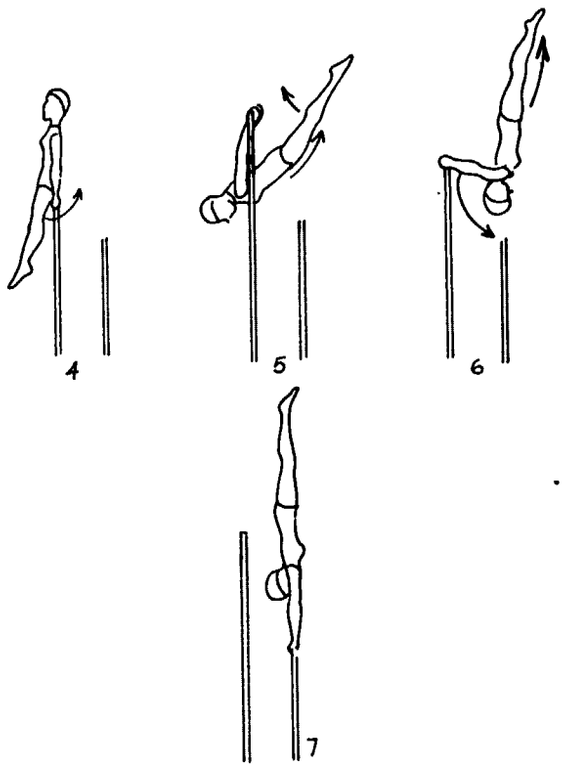
Cleo Carver is currently a sociology major at Shoreline Community College, Seattle, Washington. She has competed extensively in gymnastics and was a member of the 1968 Olympic Team, 1969 Cup of Americas Team, and the 1970 World Games Team.

The basic skills for the uneven parallel bars should be thoroughly mastered before advancing to the difficult superior moves. Pullovers, front and back hip circles, single and double leg squat-throughs, front and back seat circles, and glide kips should be taught on the single low bar. In teaching these skills, the instructor should be very specific about the progression of each move. Thorough assistance should be given at all times to build confidence and prevent the danger of a bad fall.

Once these basic moves have been perfected and can be skillfully executed on both the high and low bar, the performer is ready to begin learning superior moves.

Straight Body Seat Circle on High Bar to Handstand on Low Bar



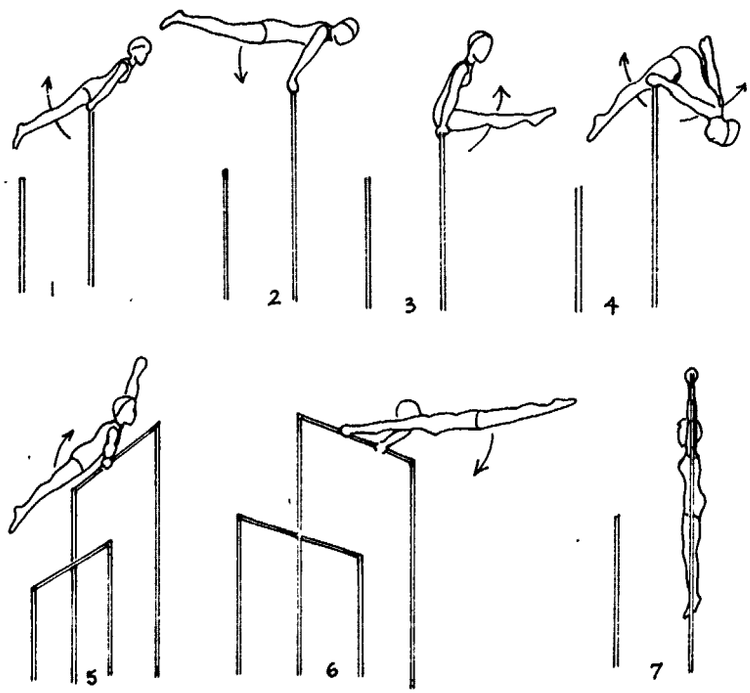


1. Assume a rear support position on high bar, facing out, with reversed grip for forward motion.
2-3. Lift legs to high V sit position, raising hips off bar.
4. Thrust legs downward for circle, hips in stretched position and resting lightly against bar.
5. Continue rotation around bar with body extended. Thrust legs upward and slightly outward to lift body over low bar.
6. When body is in highest upward position, release grasp from high bar.
7. Grasp low bar with regular grip, landing in stretched handstand position on low bar.

Possible prerequisites:

1. Dislocate from a forward seat circle on the low bar.
2. Dislocate from a forward seat circle on the high bar.
3. Handstand into a backward hip circle or sole circle on the low bar.
4. Make a straight body seat circle on low bar.

Hecht-Flank on High Bar



1. Front support facing out on high bar, hands in regular grip.
2. Cast high.
3. Return to high bar in a deep pike position.

4. Continue backward hip circle in piked position until facing downward. Then change the grip of right hand to reversed grip and at the same time release left hand.

5. Pass left arm down side of body; then thrust it extended forward, outward, and upward. At the same time thrust legs upward while lifting body off high bar. Body passes over bar in side Hecht position.

6. Maintain grip with right hand to help body continue around. As body comes over the top bar with the flank action, regrasp high bar in regular grip with the left hand.

7. Swing body, in complete extension, outward and downward to a long hang position facing low bar.

Possible prerequisites:

1. Do a Hecht dismount from low bar with 1/4 turn.
2. Do a Hecht dismount from a backward hip circle with 1/2 turn.
3. Do a Hecht dismount from a backward hip circle on high bar.
4. Do a Hecht-flank with 1/2 turn from a backward hip circle on the low bar. Two spotters catch the performer in the extended position after the 1/2 turn.

Equipment Checklist for Gymnastic Meets

LU WALLACE

Lu Wallace received her B.S. degree from Utah State University, Logan, and her M.S. degree from Washington State University, Pullman. At present she is assistant professor of physical education at Brigham Young University, Provo, Utah. She participated in the First, Second, and Fifth National Institutes on Girls and Women's Sports. She has served as subchairman of teacher training for USGF, chairman of the AIAW Gymnastics Committee and chairman of the DGWS Gymnastics Guide.

The following list has been prepared to assist in organizing the equipment and materials needed for a gymnastics meet. A quick check will identify the missing materials or assure the meet director that everything is ready for the scheduled event.

General

1. Two tape measures to measure equipment
2. Public address system
3. Wrenches and tools to adjust and tighten equipment
4. Landing mats, vault, and bars
5. Score table, chairs, and scoresheets for each event
6. First aid kit
7. Numbers to identify competitors

Floor Exercise

1. Floor exercise mat
2. Chalk with holder
3. Wet towel for feet
4. Dry towel for hands
5. Chairs for judges, runners, timers, line judges
6. Whistle to sound warning signal
7. Two stopwatches to time routines
8. Tape recorders
9. Extra take-up reels
10. Extension cords
11. Piano
12. Record players
13. Rock rosin
14. Green flag to signal "Go" or begin routine
15. Red flag for line judge

Vaulting

1. Side horse
2. Mats for landing (double thickness or landing mats)
3. Wet towel at start of approach
4. Reuther board and spacer
5. Rubber mat for runway
6. Dry towel to clean sidehorse when necessary
7. Chalk with holder
8. Score table
9. Rock rosin
10. Chairs for judges and runners
11. Green flag
12. Tape measure for contestants to mark starting point

Balance Beam

1. Balance beam
2. Mats around and under beam
3. Reuther board
4. Chalk with holder
5. Dry towel to wipe off equipment
6. Wet towel for competitor's feet
7. Fine sandpaper
8. Two stopwatches to time routine
9. One bell, dance drum, or whistle for warning signal
10. Chairs for each judge, timer, and runner
11. Rock rosin
12. Green flag

Uneven Parallel Bars

1. Uneven parallel bars
2. Extra bar in case of breakage
3. Reuther board
4. Chalk with holder
5. Sandpaper or steel wool to clean bars
6. Wet towel
7. Dry towel
8. Sandbags to stabilize uneven bars if necessary
9. Mats surrounding uneven bars
10. Stopwatch to time falls
11. Chairs for judges, runners, and timers
12. Green flag

Scorers' Table

1. List of scorers' responsibilities and procedures (tape to table)
2. Scoresheets for recording judges' scores (duplicate)

3. Prepared dittos for a summary of the results in each event
4. Team scoresheets
5. All-around scoresheets
6. Stapler with extra staples (staple judges' sheets together)
7. Box for judges' scoresheets (put in box after stapled and recorded)
8. Three or four sharpened pencils
9. Scratch paper
10. Chart on average scores to speed up tabulation (tape to table)
11. Flash cards, an overhead projector, or other means of showing final score to audience
12. Chairs

Each Judge

1. Two sharpened pencils
2. List of the order of performance
3. Worksheets for judging the events
4. Scratch paper
5. Clipboard if chairs lack desk arm for writing

Clarification of the FIG Rules for Women's Gymnastics

KAREN PATOILE
SHARON K. WEBER

Karen Patoile received her B.S. degree from the University of Washington, Seattle. She is a member of the USGF Women's Technical Committee and attended the International Women's Judging Course in Madrid, Spain in 1972. In 1971 she was a judge at the Pan American Games and recently served as coach and judge for the "US Representative to the Chunichi Cup" in Japan. She is currently teaching and coaching at Inglemoor High School, Bothell, Washington.

Sharon Weber received her B.S. and M.A. degrees from Ohio State University, Columbus. She has been active in gymnastics as a teacher and coach at the public school and university levels and is presently teaching at Lakewood High School in Colorado. She has been a committee member of three DGWS Gymnastics Guides, *is on the USGF Women's Technical Committee, and holds a FIG National Judges Rating.*

The International Women's Judging Course was held in conjunction with the 50th Congress of the International Gymnastics Federation (FIG) in Madrid, Spain during September 1971. The major rule changes occurred in the area of compulsory exercises for international competition and are not included in this article. The following information was compiled after considering the most recent international rules, current trends in competitive sports (as seen in the Munich Olympic games), and questions frequently asked by beginning judges.

General Rules

The competition is judged by four judges plus one superior judge. The superior judge's score is not counted unless the middle two scores or the average score is out of line according to the FIG point spread for preliminary or final competition. Of the four scores sent in, the high and low scores are dropped and the middle two scores averaged. If the middle scores are out of range, the superior judge

Note: Refer to the *1972 Judging Guide* and the *FIG Code of Points* for clarification of rules and regulations. Order from USGF, P.O. Box 4699, Tucson, Arizona 85717.

calls a conference and gives her score. The middle score furthest from the score of the superior judge must fall within the appropriate range. The average score must also be within range with the score given by the superior judge. If the average score is out of line with the superior judge's score, the gymnast's score is computed after consultation in the following manner:

1. The two middle scores are averaged.
2. This average score is added to the score of the superior judge.
3. This total is divided by two to arrive at the final or *base score* for the gymnast. This score is flashed.

FIG Point Differences

Preliminary Competition

Superior Judge's Score and/or Average Score	Range
9.5 - 10.0	.30
8.5 - 9.45	.50
Below 8.5	1.00

Final Competition

9.5 - 10.0	.20
8.5 - 9.45	.30
7.0 - 8.45	.50
Below 7.0	1.00

Responsibilities of a Judge

1. Every judge should have a current copy of the *FIG Code of Points* for Women's Gymnastics. She must be completely familiar with all the rules and difficulties and be able to recall this information quickly when judging.
2. A judge must be free of bias. She should evaluate the exercise presented and not allow past performance, reputation, regional trends, coaches, or other judges to influence the score.
3. A judge must have a working knowledge of the possibilities for the ultimate in amplitude and execution. (This can best be achieved by actually working with gymnasts in situations that are not competitive.)
4. She should know the elements required for the different pieces of apparatus and have a feeling for movements that create a well-composed routine.
5. She must disregard physical build and appearance. If the heavy girl is able to execute skills equally well as the slender girl, she must be scored equally. (The judge's primary concern should be the performance.)

6. A judge should arrive a minimum of 30 minutes before the meet is scheduled to begin and be dressed appropriately for the occasion.
7. There may be no smoking.
8. A judge should remain at the assigned event until it is completed. She should not talk to coaches or gymnasts during the competition unless it concerns a matter directly related to the running of that particular event.
9. A judge should not be a coach or relative of a participant in the meet.

Responsibilities of a Superior Judge

1. A superior judge makes certain that the event runs smoothly, efficiently, and without bias.
2. She checks the judges' scores to see that they fall within the proper range.
3. She judges each performance but shows her score only if scores are out of range. At this time she will call a conference and reveal her score.
4. She subtracts the penalty from the final average score when:
   a. Routines are overtime or undertime.
   b. Line faults or music violations occur in floor exercise.
   c. The coach or gymnast speaks during the routine.
   d. The coach or gymnast signals during the routine.
   e. The coach leans against the equipment during the routine.
   f. The gymnast warms up on the apparatus while the red light is on.
   g. She has pointed out a uniform deduction to the Jury of Appeal.
5. After the first performance in preliminary competition for each event, she calls a conference to check scores and establish a common base for the event.

Regulations For the Conduct of the Gymnast and Coach

1. The gymnast should present herself to the judges, especially the superior judge, before and after each routine. If she does not present herself, there is a .2 deduction.
2. Correct attire is required. Transparent leotards or improperly fitting leotards are unacceptable. There is a .3 deduction from the final all-around score if incorrect attire is worn.
3. The gymnast must wait to begin her routine until the judges are ready and a signal (green flag) is given. If she does start prior to the signal, she cannot begin again and she is not scored.
4. If there is a fall from the apparatus, the girl cannot walk away from the apparatus to get chalk; the chalk must be readily available.

5. The coach cannot signal to the gymnast (penalty .3) or talk to her (penalty .5) during the exercise. She is permitted to talk to the gymnast between the two vaults.
6. The coach must not block the judge's view during a performance; however, there is no penalty. The coach should be informed of the blocking and be asked to refrain from such actions.

Compulsory Routine Point Breakdown

Compulsory exercises for floor exercise, balance beam, and uneven parallel bars are worth 10 points and deductions are by tenths of a point. Only one execution is allowed. The 10 points are divided as follows:

4 Points for Composition

Exactness in following prescribed text	2.0
Exactness in direction and floor pattern	0.5
Exactness in the rhythm of exercise	1.5

6 Points for Execution

Sureness of the execution	1.5
Amplitude of the movements	1.5
Elegance of the gymnast	1.0
Coordination of movements (arms, trunk, legs)	1.0
Lightness of exercise (jumps, acrobatics)	1.0

Deductions by Category	*Penalty*
Exactness in following the text 2.0	
Small changes not facilitating the execution	.1
Easy part reversed	.2
Acrobatic element reversed	.5
(The entire routine may be reversed without penalty)	
Changes facilitating the execution or reversing parts	.2-.5
Omitting a medium difficulty	.5
Omitting a superior difficulty	1.0
Exactness in floor pattern 0.5	
Small directional errors	.1-.2
Larger errors (an entire pass or a combination of moves off direction)	.3-.5
(The total deduction cannot exceed .5 for this area)	
Precision of the rhythm 1.5	
Musical accompaniment not as indicated	1.0

Music to · slow or pianist aiding gymnast 5

Sureness of execution 1.5
- General form breaks (refer to Table of General Faults in *FIG Code of Points*)
- Small faults (slightly bent ankles, loss of balance, low leaps, heavy landings, etc.) 1-.2
- Medium faults (noticeable ankle bend, knee bend, very low leaps in a series or passage, etc.) 3-.4
- Serious faults (45° bend at ankle, knees, elbows, large straddling of legs, big loss of balance, no height in leaps or tumbling for a whole passage with a major difficulty or for whole exercise, etc.) ..... .5 and up

Amplitude 1.5
- "Bigness" of movements and swings, stretch of body, height of tumbling, height of swings, and length of pendulum in swings. (Do not double penalize under sureness.) 1-.5

Elegance 1.0
- Presentation and showmanship 1-.2
- Grace and beauty of performance 3-.4
- General attitude of exercise ..... .5 or up

Coordination (arms, trunk, legs, head) 1.0
- Errors in single element or combination 1-.2
- Errors in entire pass or group of combinations 3-.4
- Errors throughout ..... .5 and up

Lightness of exercise 1.0
- Heavy landing (jumps and tumbling) or hitting bar heavily 2

Optional Routine Point Breakdown

Optional routines are scored from 0.0 to 10.0 by tenths of a point. A gymnast may not be given a minus score or one that is above 10.0. The routines on the uneven parallel bars, balance beam, and floor exercise are performed only once. These three exercises are evaluated on the following:

6 Points for Composition
- Difficulty 4.0
- Originality and value of the combinations 1.5
- General composition or structure 0.5

4 Points for Execution
- Execution 1.5
- Amplitude 1.5
- General impression 1.0

Difficulty 4.0

To receive the full four points for difficulty, a routine must contain six elements of difficulty as listed in the *Code of Points.* Each superior element receives 1.0 point and each medium element receives 0.5 of a point. As dictated by the FIG in Madrid, these elements of difficulty must be in the following proportion–two superior moves and four medium moves–or there will be deductions for composition. The following examples will help to explain this new concept.

1. If the routine has six medium moves, there will be a 2.0 point deduction for lack of superior movements and a 0.5 deduction for composition because the routine does not conform to the regulations. A maximum of two points (2.0) may be scored for medium moves in the total difficulty value of the routine.
2. If the routine has six superior moves, there will not be a deduction for difficulty since superior movements may be used in the place of medium skills. The routine is credited with four points (4.0) for difficulty, but there will be a 0.5 deduction for composition because the routine does not have the necessary medium moves.
3. If a routine has three medium and two superior difficulties, there will be a 0.5 deduction for leaving out one medium difficulty. In addition, 0.2 is deducted under composition for failure to meet the required difficulties in routine. The composition deduction is the same (0.2) if the routine has four medium and one superior difficulties in the routine.

Balance beam and floor exercise must show all the required elements of difficulty but on the uneven parallel bars a gymnast may substitute superior difficulties for medium difficulties to fill the requirement if the routine is well developed and meets all the compositional requirements. The gymnast is not penalized in composition for lacking superior movements on the bars if she is only capable of performing medium difficulties.

If a difficulty is repeated during a routine, it may not be scored again as part of the total difficulty value unless it is executed in a different manner or combination. An example would be a handstand on the uneven bars. A front hip circle to a handstand on the high bar and a drop to a handstand on the low bar would both be scored as superior moves, but two front hip circle handstands on the high bar would not.

A difficulty that is nearly completed before a fall is given credit for the difficulty and deducted for the fall. However, a half-completed difficulty does not receive credit.

Originality and Value of Combinations 1.5

To receive full credit for originality and value of the combinations, a routine must meet the requirements of that particular exercise and contain movements that are unique in structure and combination. The routine must show feminine movements in beautiful, fluent combinations. Consideration must be given to the level of the combination and the logical placement of difficulty throughout the routine.

Obvious lack of one or more types of moves (penalty for each infraction) 0 1-0.2
Masculine type moves dominating entire routine ..... up to 1.5
Routine too difficult or too simple 0.5

Composition or Structure 0.5

Consider the entire structure of the routine. It should be dynamic and rhythmic using all the characteristic elements for the specific event. The mount and dismount (or the first and last pass in floor exercise) should correspond in difficulty value to the rest of the exercise.

Mount too easy or too hard 0.2
Dismount not similar in difficulty to mount 0.3
All the difficulty placed at the beginning or ending of the routine 0.5
Entire area (or both bars) not covered ..... up to 0.5
Small area not used 0.1
Overabundance of one type of movement 0.2

Execution Errors 1.5

Execution errors are the breaks in form during the course of the exercise. The general and specific deductions are the same as in the compulsory breakdown. (Refer to *Code of Points*, pages 8-9). The maximum deduction for execution is 1.5.

Amplitude 1.5

Amplitude in gymnastics can be defined as the fullness of movement. Complete body stretch and maximum height must be obtained to perform each move to its ultimate. (This is an individual accomplishment for each gymnast. The tall girl is expected to rebound higher than the very short girl.) The total deduction for amplitude errors may not exceed 1.5.

General Impression 1.0

General impression is the area in which one deducts for lack of expression, beauty, grace, dynamics, and ease of execution. There is

a deduction when a routine is not performed rhythmically and fluently within the capabilities of the gymnast's body structure The deduction should not be severe unless errors have occurred in each area mentioned above.

Uneven Parallel Bars

The routine begins when the feet leave the board or when the hands or body contact the bar, if no board is used The routine must be continuous, dynamic, and rhythmic showing changes of grip, bar-to-bar changes, changes of direction, and variety in movements. Strength moves or static positions are not acceptable. Positions of support, standing, or sitting should be very short and a required part of a combination or element rather than a stop. A maximum of two pauses is permitted for concentration just before very difficult elements.

Both bars should be used equally, with light, quick changes of grip. Routines contain approximately 12 moves; a higher number may cause fatique and increase the execution errors.

The dismount must originate from a manual handgrasp or body support. (Salto type dismounts are authorized providing they are initiated as stated above and not from a direct standing position on the bars.)

If the gymnast falls off the bars she is allowed 30 seconds before she must resume her exercise. During this time the gymnast may re-chalk her hands, repair her hand grips, re-adjust the apparatus, or take care of any other personal problems; however, if she talks to her coach or signals to anyone, the proper deductions will be taken. If the exercise is not resumed within the allowed 30 seconds, the routine is considered terminated and the judges score the portion of the exercise that was completed.

The exercise may not be repeated unless there was some fault in the equipment or a technical error in the meet. One supplementary run and takeoff for the mount is permitted if the gymnast does not touch the bar or pass under it.

In optional competition each team member must use a different routine from the compulsory including a different mount and dismount. Within a team each competitor must have an exercise that differs from the others on her team. Entire sections of a routine cannot be repeated from one exercise to another. Single elements can be the same but not combinations. A deduction of 0.3 for not adhering to the regulation is taken from the final team score. Repetition of elements within an exercise should be avoided.

Penalties Specific to Bars

1. Fall on the floor or on the bars 1.0

2. Release of one hand without supplementary support (eagle catch with one hand) 0.5
3. Release of one hand with supplementary support 1.0
4. Missed mount with a run under or touch of bar 1.0
5. Extra beat of legs only 0.3
6. Extra swing of the entire body 0.5
7. Repeating missed element 0.5
8. Coach between bars 0.5
9. Coach touches gymnast (accidental contact does not result in the same penalty unless there is an indication the coach was there to spot or makes the motion of spotting a move) 1.5
10. Coach assists on landing 0.5
11. Small brush of foot on the bar or floor 0.1
    A little heavier touch 0.2
12. Unnecessary pause in execution 0.2
13. Coach rests against supports or cables 0.2
14. Same mount or dismount as compulsory 0.3
15. Mount and/or dismount not in keeping with difficulty of exercise 0.1-0.5

Balance Beam

The exercise should be dynamic and flowing with continuity between the elements of balance, turns (full and half), jumps, leaps (large and small), locomotor moves (walking, running, skipping), and acrobatic skills. Movements from ballet, jazz, modern dance, or modern rhythmic gymnastics may be incorporated into the composition. Sitting, lying, or other low positions should be used but should not equal or exceed the number of upright positions.

The elements of difficulty should be spaced throughout the exercises. The mount and dismount must correspond to the difficulty of the entire routine.

The entire length of the beam must be used and a maximum of three pauses is permitted during a routine. Any movement in which the legs or torso do not continue moving is considered a stop. Support movements such as handstands should stretch to show the element and then move right on or they will constitute a stop.

Rhythm is an important part of a beam exercise. When there is little change of pace, or the gymnast stops before each element of difficulty, the value of the routine is lowered. There should be quick as well as sustained movements placed throughout the routine.

If a fall occurs, the gymnast is permitted 10 seconds to remount and continue the exercise. The routine will be terminated if she exceeds that time limit.

The duration of the balance beam exercise should be between 1:20 and 1:45. The time starts the moment the feet leave the floor or the hands touch the beam; the time stops at the completion of the exercise when the feet touch the floor. A warning signal is given the gymnast at 1:40 and a final signal at 1:45. If the gymnast is in the air when the final signal sounds, she is not penalized for overtime. The judges stop evaluating the exercise at the time of the second signal and any difficulties performed after that time do not receive credit.

Penalties Specific to Balance Beam

1. Fall on floor or beam	0.5
2. Touch of beam with hand in loss of balance	0.3
3. Support of hands on beam	0.5
4. Touch of beam or step under beam without mounting	0.5
5. Movements of trunk to maintain balance	0.3
6. Movement of arm or leg to maintain balance	0.2
7. Support of foot or leg on side of beam	0.4
8. Jump without amplitude	0.2
9. Unsure turns	0.2
10. Monotonous rhythm	0.2/pass
11. Monotonous rhythm throughout	0.5
12. Exercise too short	0.05/second
13. Exercise too long	0.3
14. Coach walking up and down beside beam	0.3
15. Excessive stops (more than 3)	0.2/stop
16. Fall to the floor on dismount	1.0
17. Coach assists on landing	0.5
18. Coach assists during exercise	1.5
19. Repeating a missed element	0.5

Floor Exercise

Floor exercise is the most impressive of the four events. It should present all the qualities of the gymnast including her ability to tumble and to dance, her flexibility, strength, and grace.

The time limit is 1:00 to 1:30. The first signal is given at 1;25 and the final signal at 1:30. The time begins with the first movement and stops with the final pose. The music may start before the gymnast does, but music and gymnast must end together. Music

must be from a single instrument and should suit the temperament and personality of the gymnast and enhance her performance. Organ, drum, and artificially created music may not be used.

Elements of difficulty are classified as either dance or acrobatics. The dance should dominate and the acrobatics should be logically spaced throughout the entire routine. Each pass should contain at least one element of difficulty and the entire floor area should be used in the choreography of the routine. A natural progression of the difficulty will help to complement the beauty, grace, suppleness, and dynamics of the gymnast.

There should be a show of expression that is free and natural. The gymnast should *live in the movement and the music.*

Penalties Specific to Floor Exercise

1. Fall on floor	1.0
2. Touch of hand to floor to avoid fall	0.5
3. Repetition of missed element	0.5
4. Beginning routine in ballet position	0.2
5. Beginning of exercise missed by personal error (if record player is used, gymnast must accept consequences of record skipping)	1.0
6. Musical accompaniment not regulation	1.0
7. Music not adapted to exercise	0.5
8. Exercise not finished with last beat of music	0.5
9. Fault in rhythm during exercise	0.2/time
10. Turns on flat foot (general deduction for optionals)	.1-.2 .3-.4 .5 or up
11. Running many steps into tumbling (more than 3 steps)	.1-.2
12. Gymnast outside area	0.1/time
Entire pass outside area	0.2
13. Exercise too short	0.05/second
14. Exercise overtime	0.3
15. Coach on floor area	0.5
16. Execution of back somersaults (each time):	
Under head level	.1-.2
Under shoulder level	.3-.4
Bad body position	0.2
17. Failure of hips to rise on aerials	0.2

Vaulting*

Compulsory Point Breakdown

The vault has a value of 10 and is divided as follows:

Preflight	2.0
Repulsion (Push-off)	2.0
Afterflight	2.0
Position of body during vault	2.0
Direction of vault	0.5
General balance of vault	1.5

*Penalties for Compulsory Vaulting**

Application of "0" score to a compulsory layout vault:

1. If a horizontal or bent hip vault is executed resulting in insufficient elevation or degree of preflight, the vault will *not* be scored "0."
2. It *will* be penalized according to the specific deductions given in the listing of faults for that specific compulsory vault. It will not be penalized by 0.5 for performance of the wrong vault.
   Layout vault performed at the horizontal .....2.0 deduction
   Layout vault performed below the horizontal (piked) .....3.5 deduction
3. The vault *will* be scored "0" if an entirely different vault is executed:
   a. For performance of a stoop vault when a form of the straddle or squat is required
   b. For performance of a straddle vault when a form of the stoop or squat is required
   c. For performance of a squat vault when a form of the straddle or stoop is required.

Application of penalty for insufficient elevation of a compulsory horizontal vault:

Horizontal vault performed with bent hips .....2.5 deduction

Application of "0" score to a compulsory vault executed with higher elevation (Example: Compulsory – horizontal squat; executed – layout squat):

1. The vault *will not* be scored as "0."
2. The vault *will not* be credited for the greater preflight.
3. The vault *will* be penalized by 0.5 (to encourage performance of the exact compulsory vault).

*USA Penalties and Regulations as written by Jackie Fie in a technical bulletin to the USGF Technical Committee.

Optional Vaulting

The same categories can be used to judge the optional vaults, but each vault has its own point value determined by its difficulty. Therefore, the point breakdown for each category cannot be used as it is for compulsory vaults.

General Characteristics and Regulations

All vaults must be performed with the hands placed on the horse. The gymnast is given two executions of the same or different vaults and the better of the two scores is counted. One supplementary run for the two vaults is permitted provided the gymnast does not touch the horse on one of them. The gymnast must announce her vault in advance.

A step in the direction of the vault upon landing is no longer authorized. If a small jump or step is taken upon landing, a 0.1-0.2 penalty is deducted. The coach may stand on the descent side of the horse but not between the board and the horse.

All vaults can be categorized into three types.

1. Horizontal vaults (layouts and lower vaults)
2. Vertical vaults (handstand and cartwheel)
3. Twisting vaults: a) twist during preflight, b) twist during afterflight, c) twist in both phases.

The two main phases of a vault are preflight and afterflight. The preflight consists of:

1. Takeoff – Position, arms, shoulders, legs, trajectory, lift of body
2. Arriving on the horse – position of hands, arms, shoulders, hips, and legs

The afterflight consists of:

1. Repulsion – energy forces of push-off, vitality of the reaction
2. Balance of second flight as compared to first according to vault executed
3. Stretch and extension of body during afterflight.
4. Descent – balance on floor
5. General direction of vault
6. General balance of vault

*Penalties for Optional Vaulting**

The gymnast must announce the optional vault to be performed by selecting the corresponding jump number according to the

*USA Penalties and Regulations as written by Jackie Fie.

Material compiled with use and reference to *FIG Code of Points* – Available through: USGF Office, Box 4699, Tucson, Ariz. 85717.

International Table of Vaults and then show the card to the judges. Calling the vault to the superior judge would be sufficient unless otherwise specified. If a different vault is performed, the superior judge will announce the point value on which all judges must base their score.

Vaults over 9.0

If the called and performed vaults are two different vaults, the vault performed will be the basis for the score. A 0.5 deduction will be taken from the value of the vault performed.

Vaults 9.0 and under (Straddle, stoop, squat)

The gymnast will call the vault "with designation of the type of preflight (layout, horizontal, bent hip)." The vault executed will be scored according to the specific point value of the vault performed. If the judges do not agree as to the degree of elevation, the decision of the superior judge will dictate.

Point values for vaults 9.0 and under:

Straddle	Layout 9.0	Horizontal 7.0	Pike 5.5
Stoop	Layout 9.0	Horizontal 7.0	Pike 5.5
Squat	Layout 8.5	Horizontal 6.5	Pike 5.0

0.5 point will not be deducted for performing the vault with a higher elevation than called. Deduct 0.5 only if an entirely different vault than the vault called is executed.

a. For performance of a stoop vault when a form of the straddle or squat is called.
b. For performance of a straddle vault when a form of the stoop or squat is called.
c. For performance of a squat vault when a form of the straddle or stoop is called.

Specific Penalties

Vaults through the inverted stretched support (handstand)

1. Insufficient flight between the board and the horse	up to 1.5
2. Body bent during flight	up to 0.5
3. Body bent before the inverted support	up to 1.0
4. Using force to establish the support	up to 1.0
5. Arms completely flexed throughout entire vault	2.5
6. Stop in the inverted support	0.3-0.5
7. Omission of passing through the vertical	1.0

8. Releasing the hands too late	0.3-0.5
9. Alternate repulsion of the hands	up to 0.5
10. Insufficient repulsion and afterflight	1.0-2.0
11. Poor direction of the vault	up to 0.5
12. Arms, shoulders, trunk not in same line	0.5
13. Arriving on the floor heavy and uncertain	0.2
14. Arriving on the floor out of balance	up to 0.3
15. Touching the hands on the floor	0.5
16. Supporting the hands on the floor	1.0
17. Fall on the knees	1.5
18. Fall on the hips (pelvis)	2.0
19. Fall out of balance with support of body against apparatus	1.5
20. Coach between the board and the horse	1.0
21. Aid by coach during the vault	(vault is voided)
22. Aid by coach on landing on floor	2.0

Vaults horizontal (specific penalties of that vault)

1. Body underneath the horizontal at monent of hand contact	3.5
2. Body just at horizontal (USA)	2.0
3. Body slightly above horizontal	up to 0.5
4. Straddling the legs too soon (straddle vault) or squatting (tucking) the legs too soon (squat vault)	up to 0.5
5. Flexing the legs (stoop vault)	up to 1.0
6. Omitting the stretch of the body in second flight	2.0
7. Touching the horse with feet	0.5

Vaults requiring turns (specific penalties)

1. Lack of continuity	up to 0.5
2. Tardy repulsion of hands	0.5
3. Completing the turn in the second flight after the feet are placed on the ground	0.5

COMPULSORY ROUTINES DGWS-USGF*

Beginner Level — Balance Beam

ERNESTINE CARTER WEAVER

Ernestine Carter Weaver started her gymnastic career in Canada. Her competitive record shows two Olympic Games, the World Games in Moscow, and the Pan American Games. In 1961 she was elected to the Canadian Sports Hall of Fame. She is the author of Gymnastics for Girls and Women.

The following DGWS-USGF compulsory routines and list of deductions were prepared by a joint committee from the DGWS and the United States Gymnastics Federation.

From left third of beam

I. Place hands on beam and jump to a front support. Immediately swing straight right leg over beam so as to finish in a straddle. Sit facing end of beam.

II. Immediately move hands to support in rear of body and raise straight legs to a V seat position. Bend knees into chest and execute a ½ turn left on seat, so as to finish in a "V" seat in a new position (legs extended). Right hand moves in front of body and grasps beam in order to give impetus for turn.

III. Straddle legs to grasp beam in front of body and without stopping, swing legs downward and upward to finish in a squat left forward position. Lift hands off of beam to horizontal.

IV. Stepping forward onto right foot, rise to a stand as arms move downward, sideward, left foot forward toes on beam.

V. Chasse forward (step, together, step–left, right, left), arms sideward. On last step of chasse lower arms backward, downward, forward to horizontal and kick straight right leg forward and backward to finish with right knee against left knee.

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*All compulsory routine drawings in this section were done by Nancy Hooper, Georgia College.

√Indicates changes in wording from 1971-73 *Guide*. Follow the text when discrepancies appear between the written text and the Athletic Institute Loop Films.

VI. Place right foot on beam behind left as legs bend to a squat position and execute a ½ turn right in squat. Right arm lowers parallel to left as legs are bent.

VII. Immediately rise to a stand on balls of feet. Arms rise upward to high oblique.

√VIII. Step forward on a slightly bent left leg and continue to walk forward on balls of feet, legs straight right, left (waltz step). Simultaneously lower arms downward, forward, upward to vertical (arms circle backward).

IX. Without stopping step right, lowering arms sideward and hop on right leg. The left leg is bent, knee forward, arch of left foot against side of right knee.

X. Step forward on a flexed then straightened left leg as arms move downward, forward, upward to a front oblique. Right leg is extended behind toes on beam.

XI. Without stopping, rock back on flexed then straightened right leg as arms lower downward, upward, right sideward, left vertical. Head left. Left leg is extended forward, toes on beam.

XII. Rise up on toes and make ½ turn as right arm moves upward to vertical.

√XIII. Step on left leg and, bending left knee, lunge with a stretching and contracting of torso as arms move sideward, downward, forward through the horizontal up to vertical and finish sideward.

XIV. Step forward right and join left foot to right as arms move forward to horizontal. Bend legs, grasp beam, and execute a forward roll in the pike position. A momentary stop on shoulders is allowed.

XV. Release grip and come up to a squat position on left foot, right leg in front, toes on beam. Left arm is forward in a low oblique, right arm upward in a rear oblique. Head looks over left arm. Pause.

√XVI. Stand on right leg. As right arm lowers downward, forward to horizontal.

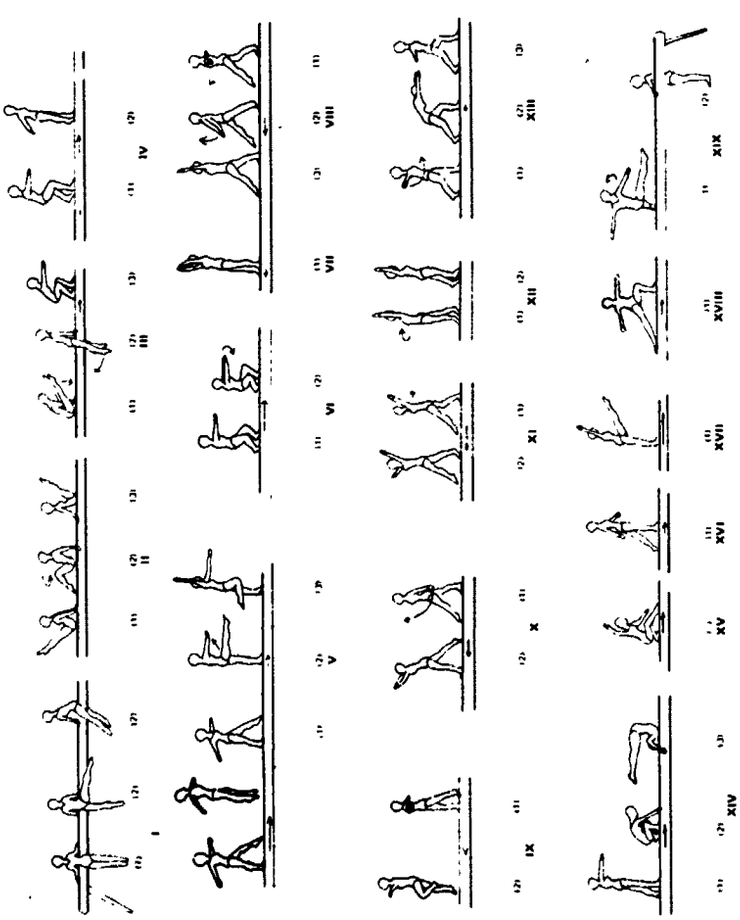
XVII. Immediately kick straight left leg forward, raising arms to vertical.

XVIII. Fall forward into deep lunge on left leg, splitting arms left forward, right rear to finish parallel to beam.

XIX. Swing arms and right leg to left so as to execute a ½ turn left on left foot in a deep lunge. As new direction is approached, push off of left leg. Grasp beam with left hand and dismount.

Exercise may be reversed only in its entirety.

Beginner Level – Balance Beam



Style

Correct styling is an important part of interpreting this exercise. The exercise should be performed with fluid and supple body movement. Posture and amplitude in all movements are of great importance.

Penalties for Beginner Level – Balance Beam

I. Bending right leg when coming to sit	0.10
Lack of amplitude while lifting leg	0.10
II. Bending of legs to attain "V" seat	0.20
Trunk bent in "V" seat	0.10
Turn slow and uncertain	0.30
III. Lack of amplitude in arriving at squat	0.20
Tardy removal of hands	0.10
Trunk bent in squat position	0.20
IV. Poor coordination of arms and body	0.10
V. Slide without elegan	0.30
Leg bent in kick	0.10
Poor posture in pose	0.20
Arm movements stiff	0.20
VI. Bending of trunk in squat	0.20
Turn uncertain	0.20
VII. Heels on beam	0.20
Incorrect position of arms	0.10
Poor posture	0.10
VIII. Insufficient suppleness during waltz step	0.20
Poor coordination	0.10
Stiff arm movements	0.10
IX. Poor position of bent leg	0.10
Lack of amplitude in hop	0.30
X. Step witho.. suppleness	0.20
Stiff arms	0.10
XI. Step without suppl ness	0.20
Stiff arms	0.10
Insufficient turn of head	0.20
XII. Bent legs	0.20
Turn uncertain	0.20
Heels on beam	0.20
√XIII. Back leg bent	0.10
Movement without suppleness	0.30
XIV. Roll uncertain	0.30
Roll off balance	0.20
XV. Poor balance	0.20
Poor posture	0.20

	Incorrect arm position	0.10
	Incorrect head position	0.10
XVI.	Poor coordination	0.20
	Poor straightening of body (posture)	0.20
√XVII.	Insufficient thrust of left leg	0.20
XVIII.	Lack of smoothness between kick and lunge	0.20
	Back bent in lunge	0.20
XIX.	Turn unsure	0.30
	Poor position of trunk (leaning forward)	0.20
	Free leg bending	0.20
	Heavy grasp of beam	0.30
	Swinging leg touching beam	0.30

Intermediate Level — Balance Beam

ERNESTINE CARTER WEAVER

From an erect stand facing roward the left third of the beam (oblique mount).

I. From a few running steps, take off from the left leg, place the right foot with the leg bent on the beam, with a brief support of the right hand, so as to finish in a squat position, left leg forward. The left arm moves forward and upward, the right arm moves backward and upward so as to finish in fifth overhead. Immediately execute a ½ turn (180°) to the right, finishing in a stand on a straight left leg. Right leg is bent, knee forward, with arch of right foot against side of left knee. Simultaneously lower left arm downward to a forward oblique position (low) and move the right arm to a rear high oblique. Head looks over left arm.

II. Extend right leg forward and step forward onto a bent right leg. Continue walking forward on balls of feet, left, right, legs straight (waltz step). While stepping on the bent right leg, the right arm drops downward, forward, and upward beside the left arm. When stepping left and right the arms continue moving upward passing through the vertical. Step forward onto bent left leg as arms continue to move backward, downward, upward with a wave of the body. Drag right leg forward as body straightens and place it in front of left foot so as to finish in a 4th position on balls of feet, legs straight, arms vertical.

III. Execute a ½ turn (180°) left on balls of feet. Arms move from the vertical to the high oblique, palms up.

IV. Close right foot to left and bend legs so as to pass through a squat position into a forward roll (pike position). Arms move from high oblique sideward, downward, forward so as to grasp beam for the forward roll.

V. Recovery from the roll is in a high "V" seat position. The arms move from the grip upward over the head to finish in a front oblique, parallel to the legs.

VI. Bend right knee so as to touch tips of toes on beam. and return leg to starting position. As right leg is returned to starting position, left leg is bent and toes touch beam. Straighten left leg as right leg bends so as to step up onto bent right leg. *Immediately* step onto a slightly bent left leg and rise to a stand on left leg, right leg behind, toes pointed on beam. As left foot is placed on beam, the arms cross in

front of the body (shoulder height), right arm above left, palms forward. As left leg is straightened, the arms move sideward and slightly backward, palms outward.

√VII. Execute a chasse forward (right, left, right). On the last step of the chasse execute a ¼ turn right, finishing with left foot beside right, on balls of feet, knees slightly bent. As the last step forward is executed, the arms move from sideward up to vertical and both move to the left of body so as to move downward in front of body on the quarter turn.

VIII. Without stopping execute a ¼ turn right by lifting right foot slightly off beam and stepping on a straight right leg in new direction, left leg extended behind, toes on beam. Arms have continued in front of body and are now horizontal forward. As weight is placed on right leg, right arm moves upward and backward downward so as to finish forward in a low oblique. As right arm reaches the vertical, the left arm moves upward to rest in the vertical position.

IX. Step forward left, lowering left arm forward to stop beside the right arm in front horizontal position.

X. Kick right leg forward as arms move sideward. Fall into a deep lunge on right heel. Right arm moves across body at chest height to finish in a slightly rounded position.

XI. Execute a ½ (180°) turn right in the deep lunge position so as to finish in a deep lunge, facing new position. Right arm swings in a horizontal position during the turn to finish in the high oblique. Left arm moves downward upward to the high oblique. Body and head twists slightly to the left.

XII. Place right hand on the beam and lift right foot off of the beam placing right hip on beam so as to sit on hip, right leg bent. Left leg is extended behind on beam. Left arm swings downward upward to a high rear oblique and downward to rest hand on hip, elbow held high. Head looks up and to the rear as hand is placed on hip.

XIII. Once again placing the weight on the right hand so as to place right shin on beam, sit on right heel. The left leg swings down side of beam so as to stop forward onto beam (bent). Left arm reaches downward and forward with left leg, and finishes horizontally. Right arm reaches for the horizontal just before left leg is placed on beam, and at the same time the weight comes off heel to pass through kneeling position.

XIV. Rise to stand on toes, right foot forward. Arms move up to vertical.

XV. Immediately execute a ½ turn left on toes, lowering the arms sideward.

XVI. Step backward on a slightly bent left leg as arms lower to sides. Step backward on slightly bent right leg as arms move upward to horizontal, head lowered (body wave). Step back on slightly bent left leg as arms move up to vertical. (The above is a continuous movement with trunk action.)

XVII. Step forward onto right foot and kick left leg up, step left placing hands left, right, on beam so as to finish in a side handbalance.

XVIII. Pick up right hand and execute ¼ turn left. Left hand grasps beam.

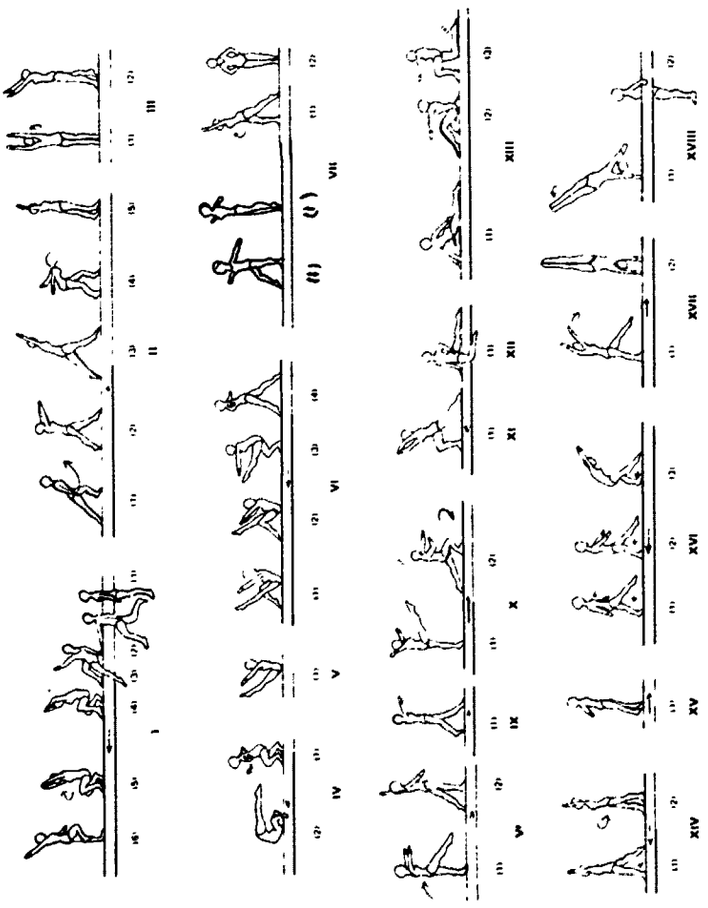
The exercise may be reversed only in its entirety.

Penalties for Intermediate Level – Balance Beam

I.	Mount heavy or off balance	0.20
	Mount with pronounced stop	0.20
	½ turn uncertain	0.10
	Incorrect movement of arms	0.10
	Poor position of trunk during turn and stand	0.20
	Head position incorrect when standing	0.10
	Execution jerky and without elegance	0.20
II.	Extended leg bent	0.10
	Walks not up high on balls of feet	0.20
	Poor coordination between arm and leg movements during the waltz step	0.20
	Poor body movement during "body wave"	0.20
	Poor coordination between arms and trunk during body wave	0.20
	Poor body and leg position while in 4th position	0.10
	Heels not a good distance off of beam	0.10
III.	½ turn uncertain	0.20
IV.	Movement not continuous	0.20
	Omission of pike position during the roll	0.20
V.	Tardy release of hands after roll	0.20
	Poor "V" seat position	0.20
VI.	Execution of leg movements jerky and without elegance	0.20
	Poor continuity of entire passage	0.30
VII.	Slide without liveliness	0.20
	Turn unsure	0.20
	Insufficient coordination	0.20
	Heels on beam during first turn	0.10
	Movement of arms without coordination	0.20
VIII.	Turn uncertain	0.10
	Movement of arms without coordination	0.20
	Lack of continuity during paragraph 7 and 8	0.20

	Movements slow and uncertain	0.20
IX.	Movement of arms without suppleness	0
X.	Poor amplitude during kick	0.10
	Leg bent during kick	0.10
	Movement of arm without suppleness	0.10
	Poor coordination between arms and legs	0.20
XI.	Back leg bent during lunge position	0.10
	Turn uncertain	0.20
	Poor arm and body coordination and continuity of movements	0.30
	Omission of twist of trunk	0.20
XII.	Movement unsure	0.10
	Incorrect movement of arms	0.10
	Omission of head position	0.10
	Lack of expression in pose	0.20
XIII.	Balance uncertain	0.30
	Incorrect arm movement and without amplitude	0.20
	Poor trunk position (lack of vertical)	0.20
XIV.	(1) Poor body position (not vertical)	0.10
	(2) Not high up on balls of feet	0.10
	(3) Head down	0.10
XV.	(1) Turn uncertain	0.20
XVI.	(1) Omission of bending the body	0.20
	(2) Lack of coordination and suppleness	0.30
	(3) Lack of continuity	0.20
XVII.	Elbows bent	0.30
	Too much arch in back	0.30
	Position not held	0.40
	Vertical not attained	0.40
	Hands touching beam simultaneously	0.20
√XVIII.	(1) Omission of picking up right hand	0.30
	(2) Tardy removal of right hand	0.20
	(3) Twist not clean and complete	0.30

Intermediate Level – Balance Beam



Advanced Level — Balance Beam

ERNESTINE CARTER WEAVER

From an erect stand, facing toward the right third of the beam (oblique mount).

I. From a few running steps, take off from the left leg, place the right leg bent on the beam with a brief support of the right hand. With the left leg extended forward, the left arm sideward, and without stopping, go on to a ½ turn to the right. The left leg is placed on beam in front of right (squat) arms rounded overhead. Immediately execute another ½ turn right in squat, finishing in a stand on toes.

II. Swing right leg backward to a high arabesque. Arms move downward to a forward, low oblique position. (Do not hold.)

III. Straighten body and displace left foot with right foot so as to finish on a slightly bent leg, left leg forward in low oblique. As body straightens, arms move very slightly upward and return to the low oblique, palms up, head tilted over left arm.

IV. With arms sideward, slide left and step left so as to jump with a ¼ turn left, landing on balls of feet. Arms are lowered to sides and head is bent forward.

V. Without stopping, raise arms sideward slightly and step towards end of beam on right foot turning ¼ turn left, finishing facing length of beam, left foot extended forward, toes on beam. At same time, right arms moves downward and upward to high forward oblique, left arm backward in a low oblique.

VI Step forward on left foot, flexing and stretching knee, stretch straight right leg behind, toes pointed on beam. At same time, bring bent right arm down in front of torso so as to finish in low front oblique. The left arm moves upward to vertical.

VII. Step forward on straight right leg and complete ½ turn right with left leg bent in front of body. At same time, the arms move sideward and continue upward to a position rounded overhead.

VIII. Immediately place left foot on beam and continue another ½ turn right on balls of feet. Arms remain overhead.

IX. Step forward right as arms lower sideward. Slide forward left, step left, and kick right leg forward so as to hop to a squat position, right foot forward. Arms move backward to

low rear oblique position, body tilted slightly forward, head tilted left.

X. Move arms sideward as the right leg is extended forward, free of beam, and sit so as to roll backward over the head in a pike position. Land on knees side by side, buttocks resting on heels.

XI. Rock forward placing weight on hands so as to push off of knees, finishing in a squat position, left foot forward.

XII. Immediately rise to a stand and execute a ½ turn right on balls of feet, and move arms forward upward to vertical.

XIII. Two steps forward right, left on slightly bent legs. Close right foot behind left, at same time arms circle backward, downward, and upward to vertical.

XIV. Execute ½ turn right on balls of feet, lowering right arm forward downward beside body, head looking over right shoulder.

XV. Step right forward with a bending and straightening of right leg and a wave of the body. Right arm moves upward, forward to join left arm in vertical position.

XVI. Kick to handstand with English grip. Bend elbows so as to execute a forward pike roll. Without stopping, straddle legs so as to grasp beam between legs. Legs swing down side of beam and pass through the horizontal (weight on hands).

XVII. Bend right knee and place foot on beam. Push off of the hands and place left foot on beam in front of right to finish in a stand on left leg. Arms move sideward.

XVIII. One or three steps (lead with right), cartwheel ¼ turn outward off end of beam.

The exercise may be reversed only in its entirety.

Style

This routine must be done with careful continuity. Good body work should be shown through all dance moves (suppleness). Correct timing is essential for movements, in order to realize their difficulty potential.

A proficient gymnast will show much amplitude in parts IV, IX, XVI and XVIII.

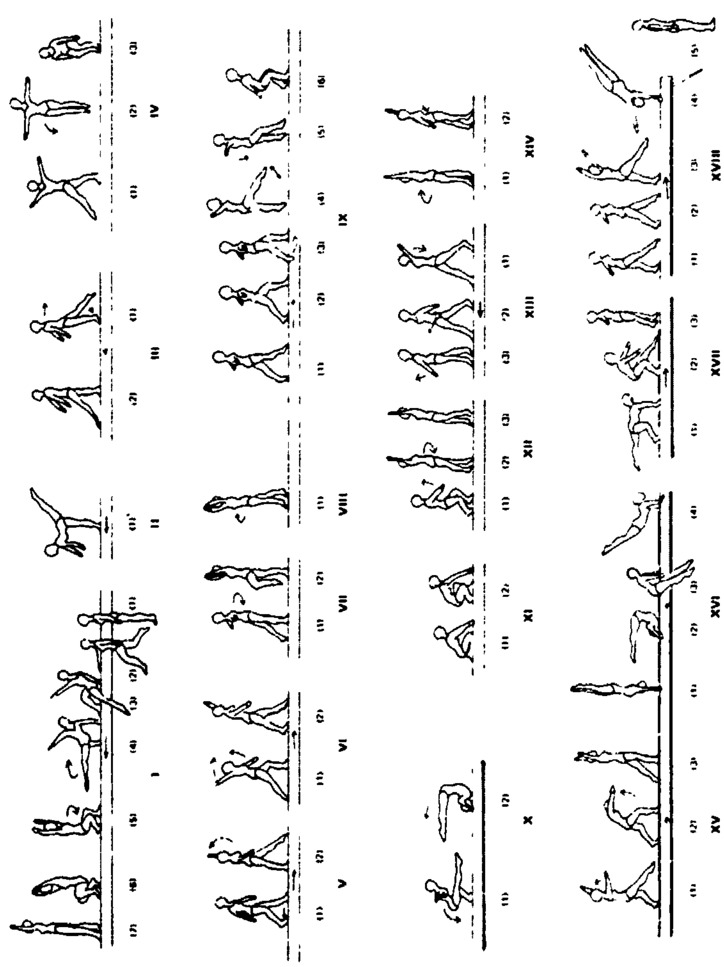
Penalties for Advanced Level – Balance Beam

I. Mount heavy or uncertain	0.20
Stopping during	0.20
Turns uncertain	0.20
Incorrect movement of arms	0.20

	Poor posture in squat	0.20
	Execution jerky and without elegance	0.20
II.	Lack of amplitude	0.30
	Poor balance	0.20
	Arms incorrect	0.10
III.	Poor posture in trunk	0.20
	Incorrect position of palms	0.10
	Movement jerky	0.10
IV.	Slide without elegance	0.20
	Covering insufficient distance	0.20
	Lack of continuity	0.20
	Landing on flat feet from ¼ turn	0.20
V.	Movement of arms without coordination	0.20
	Stepping with uncertainty	0.10
	Incorrect arm position	0.10
VI.	Movement of arms without coordination	0.20
	Movement lacking suppleness	0.20
VII.	Turn without sureness	0.30
	Lack of amplitude with left leg	0.20
VIII.	Lack of continuity between VII and VIII	0.20
	Poor arm position	0.10
IX.	Slide and jump without liveliness	0.30
	Bending at waist in squat position	0.10
	Incorrect arm position in squat	0.10
X.	Lack of continuity between squat position and roll	0.30
	Omission of pike position	0.20
	Landing on knees uncertain	0.20
	Delay in lifting head up after roll	0.20
XI.	Lack of suppleness	0.20
	Lack of amplitude [illegible]getting knees off beam	0.20
XII.	Turn uncertain	0.20
	Poor coordination of arms	0.10
XIII.	Lack of body movement	0.30
	Arms without suppleness	0.10
XIV.	Turn uncertain	0.20
	Incorrect head position	0.10
	Turn not finished on balls of feet	0.10
XV.	Movement without suppleness	0.20
XVI.	Lack of inverted position	0.40
	Bent elbows	0.30
	Too much arch in back	0.30
	Off balance	0.20
	Roll without sureness	0.30
	Delay during roll	0.20
	Horizontal not reached with legs	0.30

XVII.	Delay in releasing the beam	0.20
XVIII.	Elbows bent	0.30
	Poor flight	0.30
	Uncertain landing	0.10
	Fall on knees	0.50
	Fall on hips	1.00

Advanced Level – Balance Beam



Beginner Level — Floor Exercise

DALE FLANSAAS

1970 World Championships compulsory modified down to the lower levels by Dale Flansaas, University of Nevada, Reno.

I. 1-4 pause introduction of music

II. 1-3 pause

4. Rise onto the toes (feet side by side) with the arms vertical.

III. 1. Lower the arms quickly from forward (downward) to backward, slightly bending the legs and go on without stopping to a tuck jump, throwing the arms upward (kicking the heels toward the seat).

2. Land on both feet, left foot in front of the right, in a deep squat position, lower the arms: left arm lateral, right arm forward.

3. Straighten to a stand on the left foot, leg extended, right leg extended backward, right arm moves to lateral position. One step on the right foot, hop on the right foot thrusting the left leg extended backwards, circling the arms backward up to the vertical.

4. One step forward on the left foot and by thrusting the right leg backward, cartwheel to the left to a stand on the right leg. Make ¼ turn to the left, arms vertical.

IV. 1. One step forward on the left foot, right leg extended backward and pointed on the floor, arms lateral, head to the right. Making a ¼ turn to the left slightly bending the left leg take one step in waltz timing with the right leg, two steps left, right on the toes of the feet. Arms lateral.

2. Pivot to the left 135° (3/8) on the toes of the feet crossing the arms in front of the body (left arm closest to the body). Kick the left leg forward, arms lateral. Four running steps (left, right, left, right) and hop on the right foot and step forward on the left to a left cartwheel, ¼ turn R on the landing.

2. . . . step backward on the left foot to a backward roll landing on the slightly bent left foot, right leg stretched backward (lunge). Arms forward in a semi-wide position, obliquely downward.

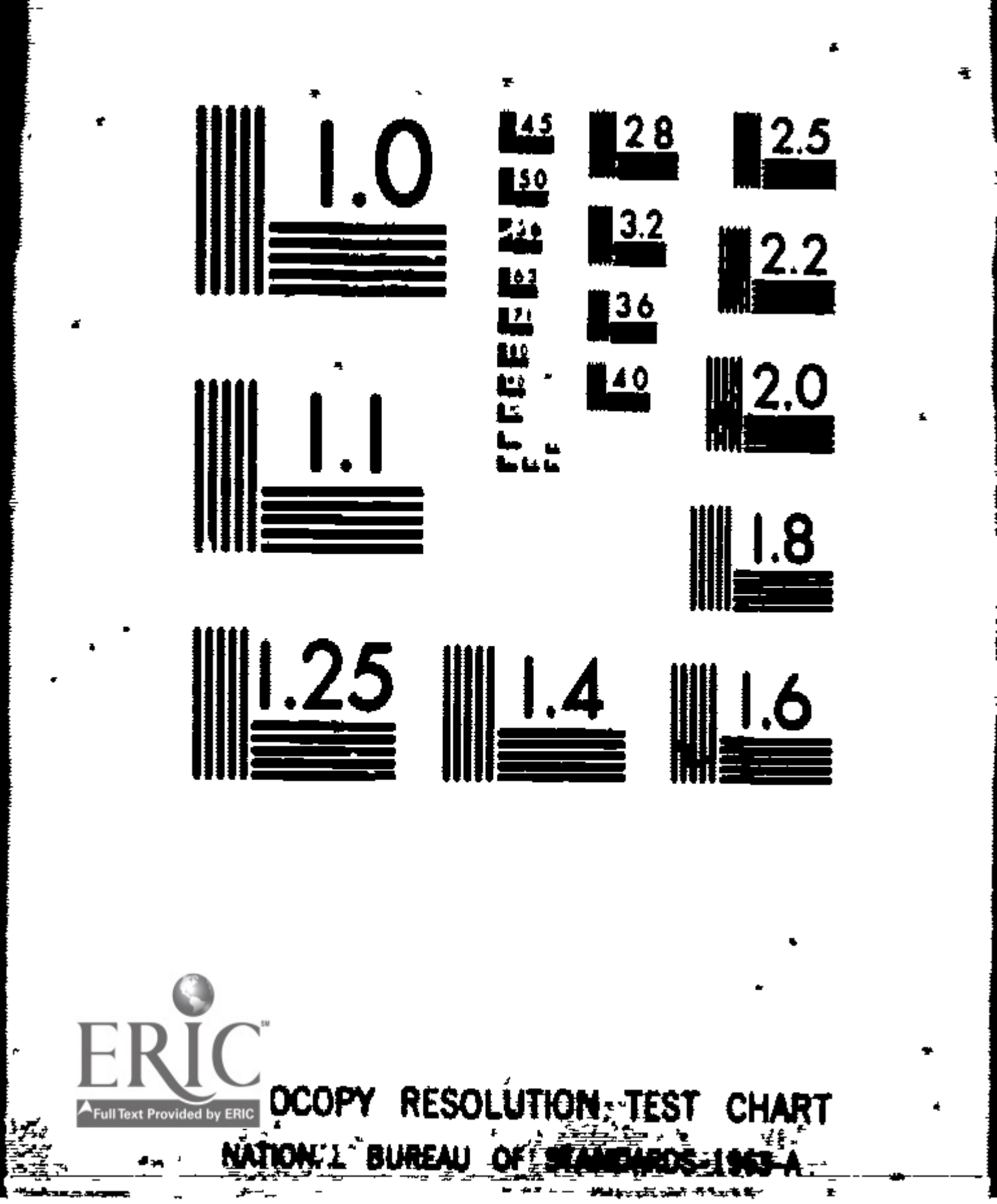
VI. 1. Circle both arms from downward to upward in front of the body, trunk straight, head looking upward, arms finish curved in an oval over the head.

2. Without stopping to on to lower the arms laterally, palms upward, slightly bending the trunk to the left, head to the left.
3. 1/8 turn to the right (45°), extending the left leg, hop on the left foot, the right leg extended forward and downward, one step on the right foot, hop on the right foot, left leg extended forward and downward (2 skips). Arms lateral.

VII. 1. One step on the left foot lowering the arms, take off on the right foot and stride leap (45° split of legs), left arm lateral, the right arm horizontal (forward). Land on left leg, right leg stretched backward.
2. One step on the right foot, arms lateral and thrust the left leg forward in order to leap with changing of the leg (scissors or hitchkick leap) with a circle outward of the arms forward to backward, landing on the left leg partially bent, the right leg extended forward and downward, the arms obliquely backward.
3. One step forward on the right foot, raise the left leg backward, arms vertical.
4. Place the hands forward on the floor and thrusting left leg upward to the inverted stretched support (handstand), change the legs in the air, and finish in a position of the left knee, hand support by the side of the legs, lower to a sitting position on the left heel, right leg stretched backward on the floor. Body is erect with a slight upper back arch.

VIII. 1. Go on without stopping by support on the left hand, displacing (lifting) the right hand with ¼ turn to the left, join the legs to a stretched lying front support (arms straight, hips touching floor).
2. Continue the movement turning once again ¼ (90°), bending the legs to sit on the right thigh (side tuck position), head to the left, left arm lateral, right hand support, turning to a bent sitting position on the left thigh, left hand placed on the floor, right arm extended laterally, head to the right.
3. ¼ turn to the left, straighten with placing of the right foot forward.

IX. 1. . . . to a stand on the toes of the feet (left foot in front of the right foot) arms extended obliquely forward and upward.
2. Bend the legs to a semi-squat stand and turn 135° (3/8 to the right in order to straighten to a stand on the toes of the feet, the right foot in front of the left).



Simultaneously lower both arms down to the sides of the body in order to raise them forward and upward with a contraction in the upper body to the vertical. (Extend the body.)

3. One step on the right foot forward bending and extending the leg, bring the left foot behind the right foot to a stand on the toes of the feet, legs extended. Simultaneously lower both arms down to the sides of the body, to the oblique forward and upward position, palms down, left hand crossed over the right hand. Head and body leaning slightly backward.

X. 1. Turn to the left 135° bending and straightening the legs and lowering the arms to the sides of the body. Place the left leg forward to a lunge on a semi-bent leg, simultaneously raise the right arm forward to the horizontal, the left arm lateral, head turned to the right.

2. Bring the right foot beside the left to a stretched stand on the toes of the feet, arms obliquely lateral and upward, palms turned outward.

3. Repeat paragraph X-1, but in reverse (lunge on right leg, left arm forward, right arm lateral).

XI. 1. Step forward on the left foot and then the right foot with the arms lateral.

2. Thrust the left leg forward, simultaneously raising the arms to the vertical.

3. Step forward on the left leg, extend the right leg backward and place the hands forward on the floor.

XII. 1. . . . and thrusting from the left foot, kick to the inverted stretched support (handstand) with the legs together, and . . .

2. . . . bend the arms to a forward roll walking out on the right foot.

3. Step forward onto the left foot, arms upward, join the right foot beside the left foot on the toes of the feet, arms lateral.

XIII. 1. Four running steps forward, left right, left, right, curving to the left, right arm lateral, left arm curved in front of the bust slightly twisting the trunk to the right.

2. With 1/8 of a turn (45°) to the left, join the left leg to the right leg, arms obliquely upward and forward. Bend the legs with the arms moving downward and obliquely backward, the trunk bent slightly forward and the head downward (contraction), straighten the legs to the stand on the toes of the feet returning the arms forward and upward, extending the body and head to the vertical.

XIV. 1. One step on left foot and hop on the left leg, right leg extended backward, arms lateral.
2. Three runs forward, right, left, right, and . . .

XV. 1. . . . stag leap, simultaneously lowering the arms to bring them obliquely forward and upward, land on the left foot.
2. Pas chasse (leap with a hop – right, left, right, arms lateral).
3. Thrust the left leg forward, pivot 225° (5/8) on the toes of the right foot to a stand on the right leg finishing with the left leg extended backward, arms lateral (forward swing turn).

XVI. 1. Bring the left leg beside the right leg, legs bent slightly. Bend the arms to touch the shoulders with the fingers, body bent slightly forward with the head down (contraction).
2. Straighten the trunk, extending onto the toes of the feet, and extend the body. Arms raised to the vertical, head upward.

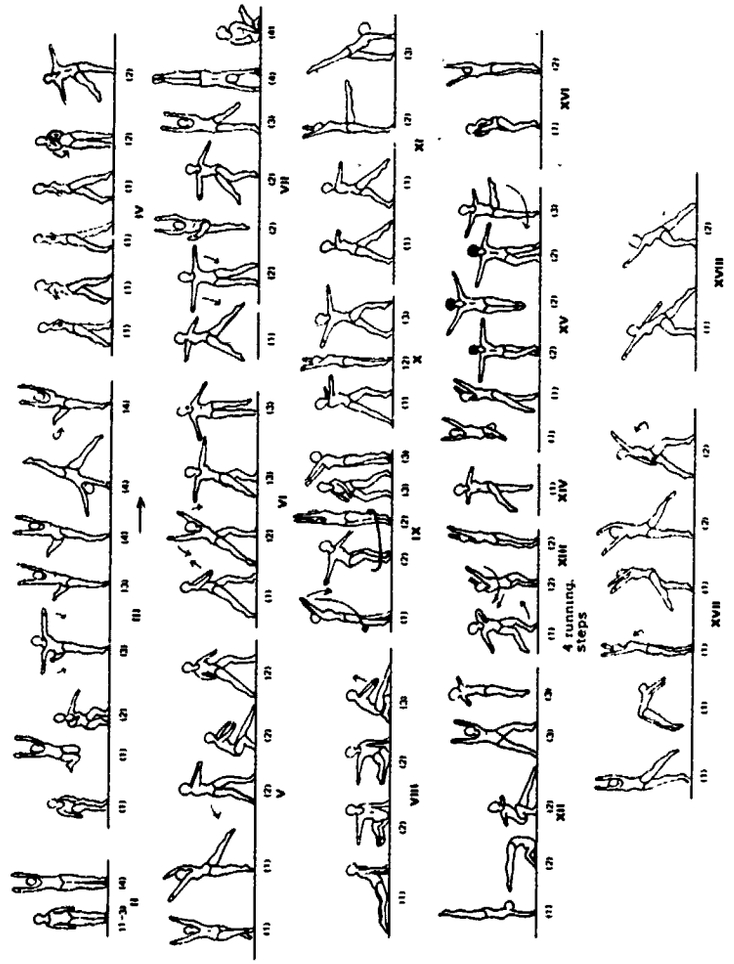
XVII. 1. Four running steps (left, right, left, right) and hop on the right foot and step forward on the left to a left round off. Jump upward off both feet, arms vertical, with a ½ turn to the left to land on the right leg slightly bent, the left obliquely forward and downward. . .
2. . . . cartwheel to the left to finish with a ¼ turn inward to the right on the right leg in a lunge position, left leg extended backward. Right arm obliquely forward and left arm obliquely backward and downward.

XVIII. 1. With a ½ turn to the left, lunge forward on the left leg, right leg extended backward. Left arm obliquely forward and upward, right arm obliquely backward and downward.
2. Bring the right arm forward to the horizontal position, head erect.

From paragraph XVII on, the exercise may be reversed in its entirety.

The total exercise may also be reversed in its entirety.

Beginner Level — Floor Exercise



Penalties for Beginner Level - Floor Exercise

II.	4. Failure to rise on toes	0.1
III.	1. Lack of amplitude	0.2
	4. Poor direction on cartwheel	0.2
	Hand simultaneous on cartwheel	0.2
IV.	1.-2. Lack of continuity and rhythm	0.2
V.	1. Poor direction on cartwheel	0.2
	Hand simultaneous on cartwheel	0.2
	2. Lack of continuity between cartwheel and roll	0.1
VI.	1.-2. Lack of coordination of arm movements	0.1
	3. Lack of amplitude on hops	0.1
VII.	1. Stride position of legs not 45°	0.1
	1.-3. Lack of continuity	0.1
	4. Failure to scissor legs	0.3
VIII.	1.-3. Lack of coordination of movements	0.1
	Lack of continuity	0.1
IX.	1.-3. Lack of coordination of arms and body	0.1
	Lack of continuity	0.1
X.	1.-3. Execution of lunges not quick and sharp	0.1 (each time)
XI.	1.-3. Lack of continuity	0.1
XII.	1. Handstand not at vertical	0.2
	2.-3. Lack of continuity	0.1
XIII.	1. Runs without lightness	0.1
	2. Lack of suppleness on body wave	0.1
XIV.	1. Hop without amplitude	0.1
XV.	1. Stag leap without amplitude	0.2
	2.-3. Lack of continuity	0.1
XVI.	1.-2. Lack of coordination	0.1
XVII.	1. Round off without amplitude	0.2
	Poor direction on round off	0.3
	½ turn incomplete	0.2
	2. Cartwheel with poor direction	0.2
	Hands placed simultaneously	0.2
XVIII.	1.-2. Lack of continuity	0.2

Intermediate Level - Floor Exercise

I. 1-4 pause

II. 1-3 pause

4. Place the left foot crossed in front of the right, both feet on the toes, raise the arms sideward to a curved position vertically over the head. Turn 360° to the right to an erect stand on the toes of both feet, the right foot in front of the left, arms vertical.

III. 1. Lower the arms quickly from forward (downward) to backward, slightly bending the legs and go on without stopping to a stag leap, throwing the arms upward, bending the left leg.

2. Land on the left foot slightly bending the left leg, right leg extended backward, lower the arms: left arm lateral, right arm forward (pass through scale).

3. Straighten to a stand on the left foot, leg extended, right leg extended backward, right arm lateral. One step on the right foot, hop on the right foot thrusting the left leg extended backwards, circling the arms backward up to the vertical.

4. One step forward on the left foot and by thrusting the right leg backward, cartwheel to the left to a stand on the right leg. Make a ¼ turn to the left, arms vertical.

IV. 1. One step forward on the left foot, right leg extended backward, arms lateral, head to the right, slightly bending the left leg, take one step in waltz crossing the right leg in front of the left with ¼ turn to the left, two steps left, right with slight bending of trunk to the right, head to the right (look over right shoulder), lowering the arms to bring the right forward, the left backward.

2. Pivot to the left 135° on the toes of the feet crossing the arms in front of the body (left arm closest to the body). Kick the left leg forward, arms lateral.

3. Place the left foot forward, while bending the leg and then extending it to straighten to a stand on the toes of the left foot, right leg extended backward. Arms remain in a lateral position.

V. 1. Three running steps (right, left, right) and hop on the right foot and step forward on the left to a dive left cartwheel, ¼ turn right on landing.

... step backward on the left foot, arms circling outward from forward to backward, finish vertical, then the right foot. Thrust the left leg forward and bend

backward to a backwalkover. Land on the slightly bent left foot, right leg stretched backward (lunge). Arms forward in a semi-wide position, obliquely downward.

VI. 1. Slightly bending the trunk to the left with circling of the right arm from downward to upward in front of body, straighten the trunk, slight bending of the trunk to the right with circling of the left arm from downward to upward, straighten the trunk (the head follows the movement of the arms, to finish with the arms curved in an oval over the head).

2. Without stooping go on to lower the arms laterally, palms upward, slightly bending the trunk to the left, head to the left.

3. 1/8 turn (45°) to the right, extending the left leg, hop on the left foot, the right leg extended forward and downward, lower the right arm and circle the forearm up to the lateral position, one step on the right foot, hop on the right foot, left leg extended forward and downward, lower the left arm and circle the forearm up to the lateral position, head follows the movement of the arms.

VII. 1. One step on the left foot, lowering the arms, take off on the right foot and stride leap (45° split of legs), left arm lateral, the right arm horizontal (forward). Land on the left leg, right leg stretched backward.

2. One step on the right foot, arms lateral and thrust the left leg forward in order to leap with changing of the leg (scissors or hitchkick leap) with a circle outward of the arms forward to backward, landing on the left leg partially bent, the right leg extended forward and downward, the arms obliquely backward.

3. One step forward on the right foot, raise the left leg forward to the horizontal, arms lateral.

4. Bend the right leg and sit down to a backward roll, joining the legs together, then spread them apart to finish in a position on the left knee, hand support by the side of the legs, lower to a sitting position on the left heel, right leg stretched backward on the floor. Body is erect with a slight upper back arch.

VIII. 1. Go on without stopping by support on the left hand, displacing (lifting) the right hand with ¼ turn to the left, join the legs to a stretched lying front support (arms straight, hips touching floor).

2. Continue the movement turning once again ¼ turn (90°), bending the legs to sit on the right thigh (side tuck position), head to the left, left arm lateral, right

hand support, turning to a bent sitting position on the left thigh, left hand placed on the floor, right arm extended laterally, head to the right.

3. ¼ turn to the left, straighten with placing of the right foot forward.

IX. 1. . . . to a stand on the toes of the feet (left foot in front of the right foot) arms extended obliquely forward and upward.

2. Bend the legs to a semi-squat stand and turn 135° (3/8 to the right in order to straighten to a stand on the toes of the feet, the right foot in front of the left). Simultaneously lower both arms down to the sides of the body in order to raise them forward and upward with a contraction in the upper body to the vertical. (Extend the body.)

3. One step on the right foot forward bending and extending the leg, bring the left foot behind the right foot to a stand on the toes of the feet, legs extended. Simultaneously lower both arms down to the sides of the body in order to raise them forward and upward with a contraction in the upper body, to the oblique forward and upward position, palms down, left hand crossed over the right hand. Head and body leaning slightly backward.

X. 1. Turn to the left 135° (3/8) bending and straightening the legs and lowering the arms to the side of the body. Place the left leg forward to a lunge on a semi-bent leg, simultaneously raise the right arm forward, the left arm lateral, head turned to the right.

2. Bring the right foot beside the left to a stretched stand on the toes of the feet, arms obliquely lateral and upward, palms turned outward.

3. Repeat paragraph X-1, but in reverse (lunge on right leg, left arm forward, right arm lateral).

XI. 1. Step forward on the left foot and then the right foot with the arms lateral.

2. Thrust the left leg forward, simultaneously raising the arms to the vertical.

3. Step forward on the left leg, extend the right leg backward and place the hands forward on the floor.

XII. 1. . . . and thrusting from the left foot, kick to a front walkover landing on the right foot.

2. Step forward onto the left foot, arms upward, join the right foot beside the left foot on the toes of the feet, arms lateral.

XIII. 1. Four running steps forward, left, right, left, curving to the left, right arm lateral, left arm curved in front of the bust slightly twisting the trunk to the right.
2. With 1/8 of a turn (45°) to the left, join the left leg to the right leg, arms obliquely upward and forward. Bend the legs with the arms moving downward and obliquely backward, to the left side of the body, the trunk bent slightly forward and the head downward (contraction), straighten the legs to a stand on the toes of the feet returning the arms forward and upward, extending the body and head to the vertical.

XIV. 1. One step on the left foot and hop on the left leg, right leg extended backward, left arm obliquely upward and forward, right arm obliquely downward and backward.
2. Three runs forward, right, left, right, and . . .

XV. 1. . . . stag leap, simultaneously lowering the arms to bring them obliquely forward and upward, land on the left foot.
2. Pas chasse (leap with a hop–right, left, right), arms lateral.
3. Thrust the left leg forward, pivot 225° (5/8) on the toes of the right foot, to a stand on the right leg finishing with the left leg extended backward, arms lateral (forward swing turn).

XVI. 1. Step forward on the left foot to a semi-bent stand, right foot extended backward (lunge). The trunk and head are inclined forward, lower the arms straight downward, crossing them in front of the body and rapidly extending them obliquely lateral and downward.
2. Straighten the trunk, bending the arms near the shoulders.
3. Join the right foot to the left foot to a stand on the toes of the feet, arms obliquely upward, palms facing toward the body.

XVII. 1. Four running steps (left, right, left, right) and hop on the right foot and step forward on the left to a left round-off. Jump upward off both feet, arms vertical, with a ½ turn to the left to land on the right leg slightly bent, the left obliquely forward and downward . . .
2. . . . tinsica to the left finishing with the arms vertical and the left foot extended obliquely downward.
3. One step on the left foot with a hop, right leg extended backward, arms lateral.

XVIII. 1. Extend the right leg and lunge forward on the bent right leg, left leg stretched pointing backward, lower the arms

backward, raise the right arm obliquely forward and upward, left arm remaining backward and downward.

2. Make a ½ turn to the left on the right foot, arms lateral. Step forward on the left foot, thrust the right leg forward making a ½ turn to the left on the toe of the left foot to finish with the right leg extended backward (forward swing turn). Arms lateral. Extend the right leg forward and lunge forward on the bent right leg, left leg stretched backward, right arm obliquely upward, left arm obliquely backward and downward.
3. Lower the left arm in order to return it obliquely forward and upward, circle the left arm backward and circle the right forearm in front of the body, extend the arms obliquely forward and upward, slightly twisting the trunk to the left (standing to the left corner of the floor area).

From Paragraph XVII on, the exercise may be reversed in its entirety.

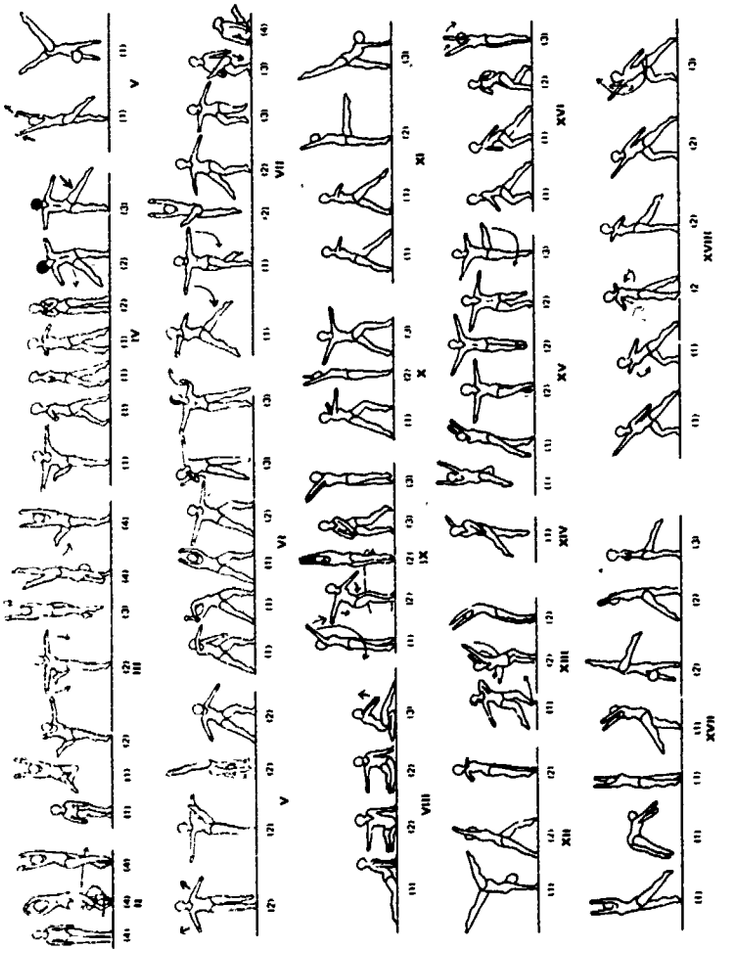
The total exercise may also be reversed in its entirety.

Music available for Compulsory Routines

Record HLP 4102 *Compositions for Floor Exercise.* Dale Flansaas. Carmen Sorensen, pianist. Hoctor Dance Records, Inc., Waldwick, N. J. 07463.

Tapes of USGF/DGWS Floor Exercise. Music for National Compulsory Routines. $2.00. Order from Betty Meyer, Northeastern Illinois State University, Bryn Mawr at St. Louis, Chicago, Ill. 60625.

Intermediate Level — Floor Exercise



Penalties for Intermediate Level — Floor Exercise

II.	4. Turn incomplete	0.1
III.	1. Lack of amplitude	0.2
	4. Poor direction on cartwheel	0.2
	Hands simultaneous on cartwheel	0.2
IV.	1.-3. Lack of continuity and rhythm	0.2
V.	1. Poor direction on cartwheel	0.2
	Hands simultaneous on cartwheel	0.2
	No dive on cartwheel	0.3
	2. Lack of continuity between cartwheel and back walkover	0.1
	Lack of suppleness on back walkover	0.1
VI.	1.-2. Lack of coordination of arms movements	0.1
	3. Lack of amplitude on hops	0.1
VII.	1. Stride position of legs not 45°	0.1
	1.-2. Lack of continuity	0.1
	4. Lack of continuity and lightness on backward roll	0.1
VIII.	1.-3. Lack of coordination of movements	0.1
	Lack of continuity	0.1
IX.	1.-3. Lack of coordination of arms and body	0.1
	Lack of continuity	0.1
X.	1.-3. Execution of lunges not quick and sharp	0.1 (each time)
XI.	1.-3. Lack of continuity	0.1
XII.	1. Lack of suppleness on front walkover	0.1
XIII.	1. Runs without lightness	0.1
	2. Lack of suppleness on body wave	0.1
XIV.	1. Hop without amplitude	0.1
XV.	1. Stag leap without amplitude	0.2
	2.-3. Lack of continuity	0.1
XVI.	1.-2. Lack of coordination	0.1
XVII.	1. Round off without amplitude	0.2
	Poor direction on round off	0.3
	1/2 turn incomplete	0.2
	2. Hands placed simultaneously	0.2
	Walkover in place of a tinsica	0.5
XVIII.	1.-2. Lack of continuity	0.2

Advanced Level — Floor Exercise

I. 1-4 pause

II. 1-3 pause

4. Place the left foot crossed in front of the right, both feet on toes, raise the arms to the left, left arm upward and oblique, the right arm curved in front of the body, palm upward; lower the arms and turn by ½ spiral 360° to the right to an erect stand on the toes of both feet, the right foot in front of the left, arms vertical.

III. 1. Lower the arms quickly from forward (downward) to backward, slightly bending the legs and go on without stopping to stag leap, throwing the arms upward, bending the left leg, toes of the left foot touching the right knee.

2. Land on the left foot, slightly bending the left leg, the right leg stretched backward, lower the arms; left arm lateral, right arm forward (pass through scale).

3. Straighten to a stand on toes of the left foot, leg extended, right leg extended backward, right arm lateral, one step on the right foot, hop on the right foot thrusting the left leg extended backwards, circling the arms backward up to the vertical.

4. One step forward on the left foot and by thrusting the right leg backward, handspring forward to a stand on the right leg, left leg obliquely forward and downward, arms vertical.

IV. 1. One step forward on the left foot, right leg extended backward, arms lateral, head to the right, slightly bending the left leg take one step in waltz crossing the right leg in front of the left with ¼ turn to the left, two steps (left, right), with slight bending of trunk to the right, head to the right (look over the right shoulder), lowering the arms to bring the right forward, the left backward.

2. Pivot to the left 135° on the toes of the feet, lift the left leg to the oblique forward and downward position, with slight bending of the trunk forward and twist to the right, head lowered, left arm curved in front of the body, right arm extended backward.

3. Place the left foot forward, while slightly bending and extending the legs, body wave in order to straighten to a stand on the toes of the left foot, right leg extended backward, simultaneously lowering the left arm to raise

it up again obliquely upward, the right arm obliquely backward, the head raised toward the left hand. (IV 1-3 in waltz rhythm.) The gymnast is in the corner of the floor area, facing the center.

4. Step on the right foot and hop with the left leg extended backward, simultaneously lowering the right arm to raise it obliquely upward.

V. 1. . . . and with a step on the left foot, place the arms forward taking off the left leg, thrusting the right leg backward into a tinsica to a stand on the right leg, left leg extended obliquely forward and downward, left arm horizontal, right vertical. Place the left foot forward and cartwheel to the left, and then ¼ turn to the right, step backward on the left foot, arms circling outward from forward to backward, finish vertical, then the right, thrusting the left leg forward and bend backward to a backwalkover.

VI. 1. . . . to a stand on the slightly bent left leg, right leg stretched backward (lunge) slightly bending the trunk forward, arms forward in semi-wide position obliquely downward.

2. Slightly bending the trunk to the left with circling of the right arm from downward to upward in front of body, straighten the trunk, slight bending of the trunk to the right, with circling of left arm from downward to upward, straighten the trunk (the head follows the movement of the arms, to finish the arms curved in an oval over the head).

3. Without stopping, go on to lower the arms laterally, palms upward, slightly bending the trunk to the left, head to the left.

4. 1/8 turn (45°) to the right, extending the left leg, hop on the left foot, the right leg extended forward and downward, lower the right arm and circle the forearm up to the lateral position, one step on the right foot, hop on the right foot, left leg extended forward and downward, lower the left arm and circle the forearm up to the lateral position, head follows the movement of the arms.

VII. 1. One step on the left foot lowering the arms, take off on the right foot and stride leap, left arm lateral, the right arm horizontal (forward), land in a stand on the left leg, right leg stretched backward, arms lateral.

✓2. One step on the right foot, arms lateral and swing (thrust), the left leg forward in order to leap with changing of the leg (scissors or hitchkick leap) with a

circle of the arms forward to backward, landing on the left leg partially bent, the right leg extended forward and downward, the arms slightly obliquely backward.

3. One step forward on the right foot with bending and extension of the legs, body wave, forward to a stand on the right leg, thrust the left leg forward, lower the arms laterally in order to raise them again to forward and upward.
4. Continue movement of the left leg and the arms to place the hands on the floor and turn backward passing through the inverted stretched support (back walkover) to a position on the left knee, hand support beside the legs, lower to a sitting position on the left heel, right leg stretched backward on the floor, the hands placed on the floor, arching the body.

VIII. 1. Go on without stopping by support on the left hand, displacing (lifting) the right hand with ¼ turn to the left, join the legs to a stretched lying front support.

2. Continue the movement turning once again ¼ (90°), bending the legs to sit on the right thigh, head to the left, left arm lateral, right hand support, turning to a bent sitting position on the left thigh, left hand placed on the floor, right arm extended laterally, head to the right.
3. ¼ turn to the left, straighten with placing the right foot forward.

IX. 1. . . . to a stand on the toes of the feet (left foot in front of the right foot), arms extended obliquely forward and upward.

2. Bend the legs to a semi-squat stand, lower the right arm forward, followed by the left arm to the left side and turn 135° (3/8) to the right in order to straighten to a stand on the toes of the feet, the right foot in front of the left, the arms upward, the trunk and head following the movements of the arms.
3. Slightly bending the arms, palms upward, lower them. Lower the left leg slightly bent (to a semi-bent stand on the left leg), right leg extended forward and downward, the arms supple, lateral, upward.
4. One step on the right foot forward bending and extending the legs with a body wave, bring (draw) the left foot behind the right foot to a stand on the toes of the feet, legs extended, head extended, simultaneously raising the arms forward, elbows and hands joined, then

straighten (extend) the arms obliquely upward, palms down, left hand on the right hand.

X. 1. Turn to the left 135° (3/8) bending then straightening the legs and lowering the arms, by extending quickly the legs, slide the feet on the floor in order to slightly advance into a forward lunge on the semi-bent left leg and the toes of the feet, simultaneously raise the right arm forward, the left arm lateral, head turned to the right.

2. By rapid extension of the left leg, reunite the right foot to the left, to a stretched stand on the toes of the feet, arms obliquely lateral and upward, palms turned outward.

3. Repeat paragraph X-1 but in reverse (lunge on right leg, left arm forward, right arm lateral).

XI. 1. One step forward on the left foot with swing of the trunk to the right, left arm bent in front of the bust, head to the right.

√2. Extending the left arm laterally, thrust right leg extended, then bent forward, knee to outside; toes of right foot against left leg, simultaneously pivot 360° to left, arms curved in oval over the head.

3-4. Extend right leg backward and with inclination (bending) of trunk forward, front scale to a stand on left leg, simultaneously lower arms, semi-bent laterally, forearms joined, lower arms bent then extend up to an oblique downward position.

XII. 1. . . . and place the hands on the floor, then by thrusting from the left foot, kick to an inverted stretched support (handstand) with legs together and . . .

2. Separate the legs (left forward, the right backward).

3. Slowly turn to a stand on the right leg (walkover-out), left leg extended forward, arms upward, one step forward on the left foot, join the legs to a stand on the toes of the feet, arms lateral (facing the initial direction).

√XIII. 1-2. Four running steps, left, right, left, right, curving to the left, right arm lateral, left arm curved in front of the bust slightly twisting the trunk to the right.

3. With 1/8 of a turn (45°) to the left, join the left leg to the right leg, arms obliquely upward and forward, bend the legs with ½ circumduction (rotation) of the trunk and circle the arms parallel from upward-downward to the left, extending the legs to a stand on the toes of the feet returning the arms backward to the left side up to a vertical position.

XIV. 1. Twist the trunk to the right, arms to the right lateral, one step on the left foot and hop on the left leg, right leg extended backward, circle the left arm in front of the body up to an oblique forward and upward position, right arm obliquely downward and backward.
2. One step on the right foot forward on the toes of the foot, left leg bent, the toes of the foot touching the right knee and turn 360° to the left, arms curved forward, extend the left leg and step forward on the left foot, arms lateral.

Paragraphs XIII – XIV are executed on a curved line to the left.

XV. 1. One step on the right foot and stag leap with bending of the left leg, slightly twisting the trunk right, simultaneously lowering the arms to bring them obliquely forward and upward, land on left foot.
2. Pas chasse—leap with hop (right, left, right), arms lateral.
3. Thrust the left leg. pivot to the right 225° (5/8) on the toes of the right foot to a stand on the right leg, the left leg extended forward and downward, arms lateral.

XVI. 1. One step forward on the left foot to a semi-bent stand, right foot pointed behind the left foot, the trunk and the head inclined forward, lower the arms straight downward, crossing them in front of the body and rapidly extend them obliquely lateral and downward.
2. Straighten the trunk, bending the arms near the shoulders.
3. Join the right foot to the left foot to a stand on the toes of the feet, arms obliquely upward, palms inward.
4. Two running steps right, left, lowering the arms laterally to return them forward and upward.

XVII. 1. One step on the right foot and by thrusting the left leg backward, hop, then step forward on the left foot, perform a left roundoff and flip flop (back handspring) to a stand on the left leg, right leg stretched backward and ½ turn to the right to stand on the left leg, right leg extended forward and downward, arms lateral.
2. One step on the right foot, one step on the left foot with a hop, thrust the right leg forward and to the right stretched then bent, toes of the right foot touching the left knees, circle of the arms backward.

XVIII. 1. Extend the right leg and lunge forward on the bent right leg, left leg stretched pointing backward, lower the arms backward, raise the right arm obliquely forward and upward, left arm remaining backward and downward.
2. Draw back (bring) the weight of the body on the left

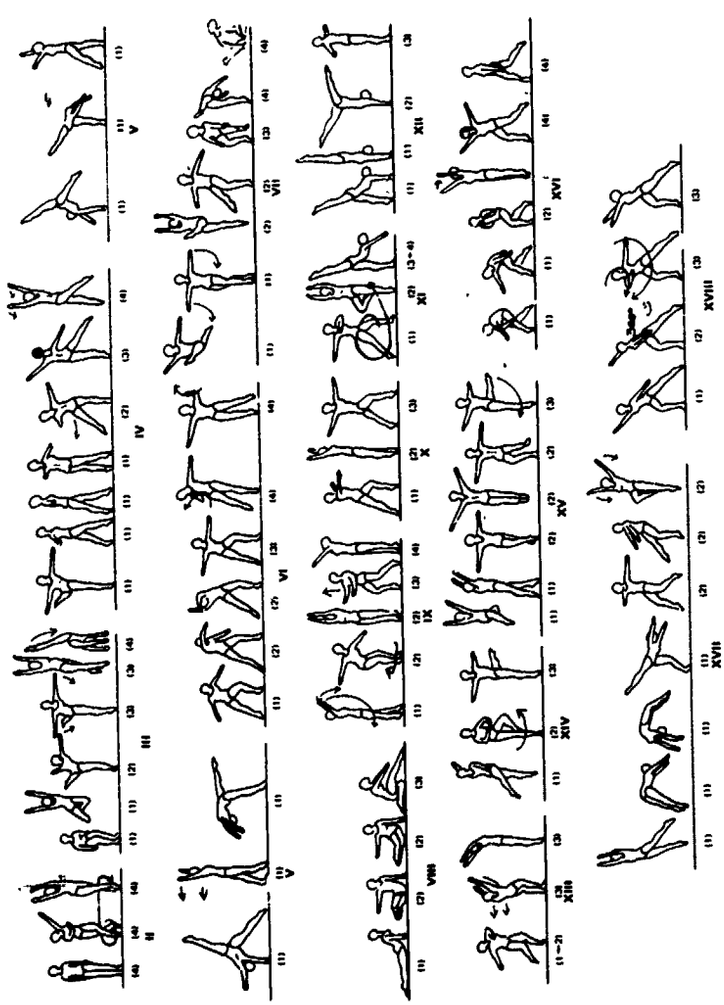
foot, turn to the left toward the back (rearwards) (360°), body slightly to the oblique forward around the long axis, to return into a lunge, right arm upward, left arm on the thigh along the body (held against the body).

3. Lower the left arm in order to return it obliquely forward and upward, circle the left arm backward and circle the right forearm in front of the body, extend the arms obliquely forward and upward, slightly twisting the trunk to the left (standing to the left corner of the floor area).
4. Pause.

From Paragraph XVII on, the exercise may be reversed in its entirety.

The total exercise may also be reversed in its entirety.

Advanced Level – Floor Exercise

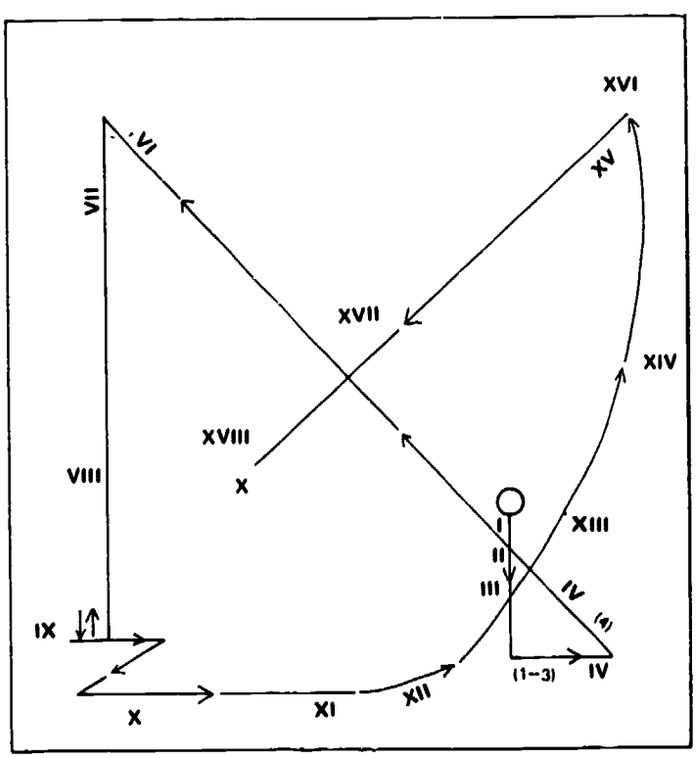


Penalties for Advanced Level – Floor Exercise

II.	4. Turn incomplete	0.1
III.	1. Lack of amplitude	0.2
	2. Foot not touching knee on stag leap	0.1
	3. Leg below the horizontal	0.1
	4. Walkover in place of a handspring	0.5
	Lack of amplitude on handspring	0.2
IV.	1.-3. Lack of continuity and rhythm	0.2
V.	1. Hands placed simultaneously on tinsica	0.2
	Walkover in place of tinsica	0.5
	Poor direction on cartwheel	0.2
	Hands simultaneous on cartwheel	0.2
	2. Lack of continuity between carthweel and back walkover	0.1
	Lack of suppleness on back walkover	0.1
VI.	1.-2. Lack of coordination of arm movements	0.1
	3. Lack of amplitude on hops	0.1
VII.	1. Stride position of legs not more than 45°	0.1
	1.-3. Lack of continuity	0.1
	4. Lack of suppleness and continuity on back walkover	0.2
VIII.	1.-3. Lack of coordination of movements	0.1
	Lack of continuity	0.1
IX.	1.-4. Lack of coordination of arms and body	0.1
	Lack of continuity	0.1
	Body wave insufficient	0.1
X.	1.-3. Execution of lunges not quick and sharp	0.1 (each time)
XI.	1. Incorrect position of head	0.1
	2.-4. Lack of continuity of arms during turn and front scale	0.2
	Turn not on toe	0.2
	Incomplete pivot	0.3
	Position of leg too low during the front scale	0.2
XII.	1.-3. Handstand not at vertical	0.2
	Lack of suppleness on walkover	0.1
XIII.	1. Runs without ligthness	0.1
	3. Lack of suppleness on body wave	0.1
XIV.	1. Hop without amplitude	0.1
	2. Turn incomplete	0.2
XV.	1. Stag leap without amplitude	0.2
	2.-3. Lack of continuity	0.1
XVI.	1.-3. Lack of coordination	0.1

XVII.	1.-4. Lack of continuity in execution of flip flop, ½ turn, and jump	0.2
	Omission of jump with ronde jambe	0.2
XVIII.	2. Turn not around axis	0.2
	Lack of continuity	0.2

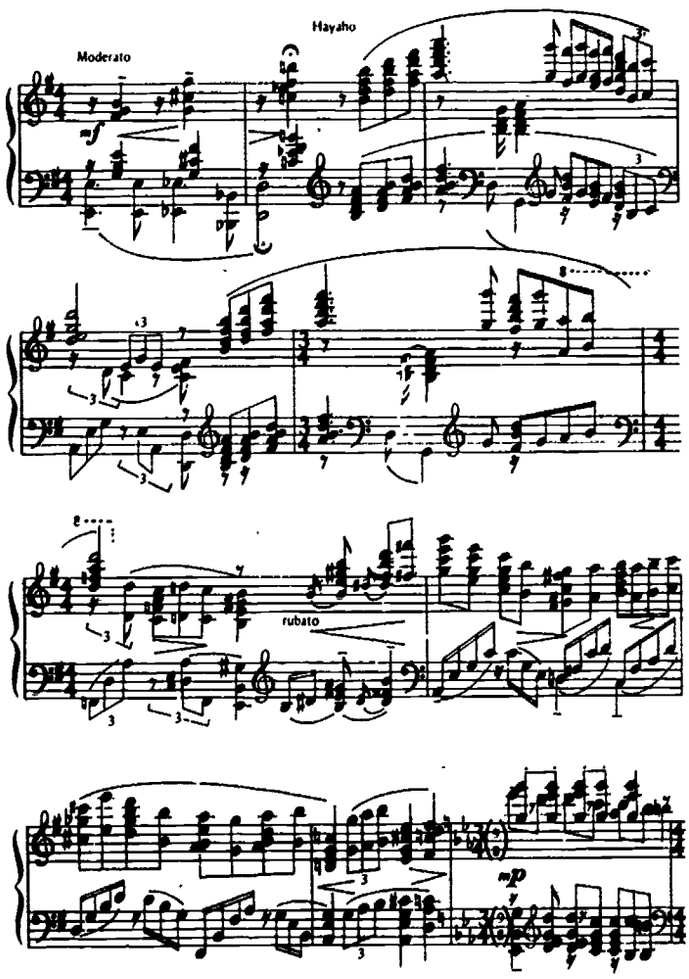
Floor Plan for Floor Exercises

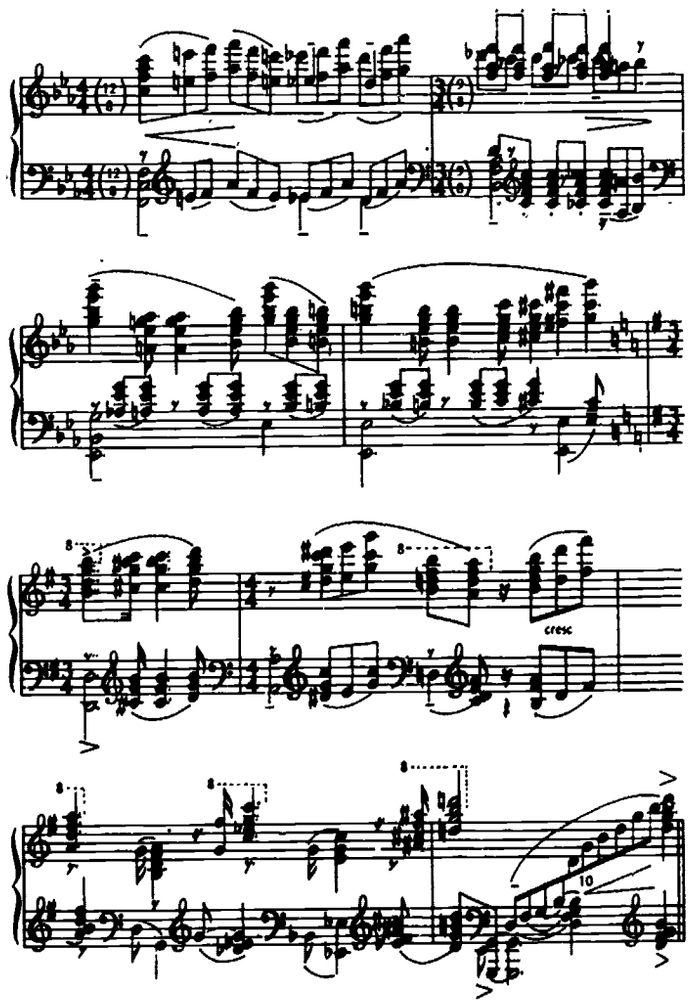


The United States Gymnastics Federation Women's Committee

WORLD GAMES - 1970 COMPULSORY FLOOR EXERCISE MUSICAL ACCOMPANIMENT

Musical Arrangement by Julia Brumgart

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Beginner Level — Uneven Bars

MARGIT TREIBER

Starting position:

Outer side stand, facing inward under the high bar.

I. Jump to long hang on high bar both hands in overgrip. Pump swing (pike from hips) forward, backward, straddle shoot over the low bar to rear lying hang.

II. Bend the right knee and place the ball of the foot on the low bar (shift weight to right foot).

III. Swing the extended left leg forward upward and simultaneously push off from the right foot. Join legs (extended) in a pike position to execute a backward hip pull over to front support on high bar.

IV. Drop backwards through kip position, arms extended, ankles held above high bar. Lower the legs with control into a rear lying hang over the low bar.

V. Execute a 180° thigh roll to the left into front support position, regrasp low bar with the right hand outside of right thigh in over grip, followed by a regrasp with left hand on the low bar, outside of left thigh in over grip.

VI. Swing legs forward, then backward to free front support (cast) and hip circle backward to front support.

VII. Continuously swing legs forward, then backward to free front support (cast) and cut the rignt leg over the low bar under the right hand to a stride support. Momentarily lower the body to the bar to switch both hands into under grip position. (Lift into hand support position again.)

VIII. Forward stride circle (mill circle) 360° into stride support position. (Bar under the front thigh at finish).

IX. Grasp the high bar with left hand in over grip, swing left leg from backward to the left side over the low bar to join the right leg. Simultaneously grasp the high bar with right hand using over grip.

X. Swing legs downward slightly (beat) then upward into a tight pike position holding the hips up high. Shoot the legs upward-outward followed by the hips to a straight body extension to execute a 180° turn to the left. (Underswing-Half turn). Right hand regrasp with over grip.

XI. Swing forward under low bar, upon body contact deeply pike at hips. (Wrap swing). Extend pike and start swing backward with full body extension then pike at hips. On the top of the

flight change quickly the grip of the left hand to over grip on the high bar. (Both hands in over grip now).

XII. Swing forward in piked position. Place the ball of the right foot on low bar, left leg extended over the low bar. Bend the right knee into squat position, lift the extended left leg close to high bar. Push with right foot and execute a single leg stem rise to front support on high bar.

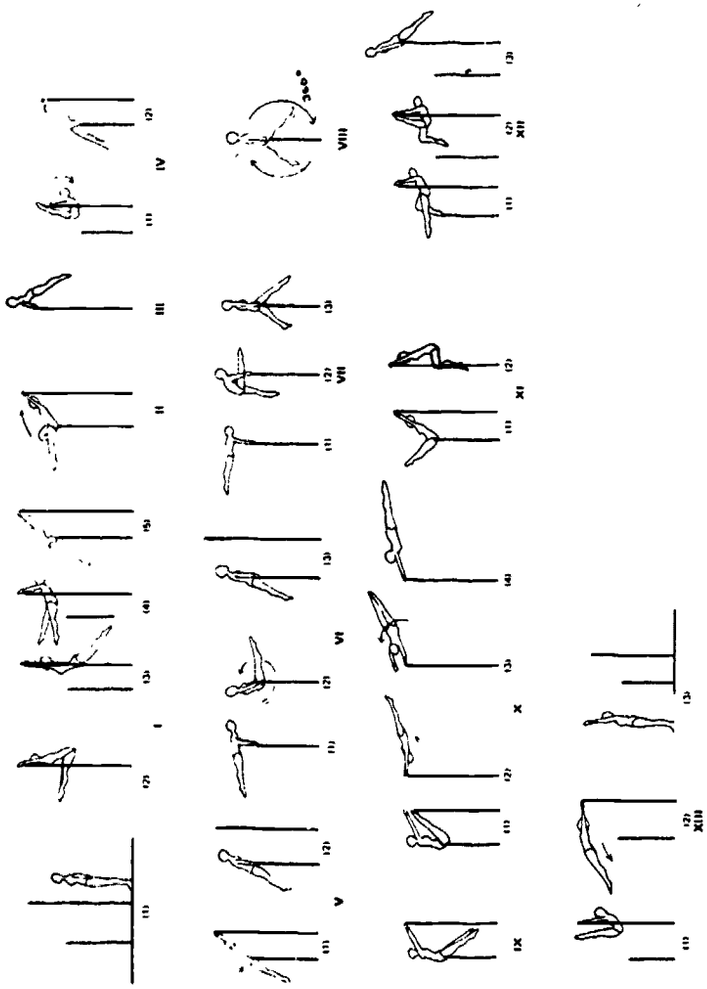
XIII. Without stop, drop backward with straight arms through kip position, by piking at hips and holding the extended legs close to high bar. Swing over the low bar, shoot legs upward and outward followed by the hips to an arched body extension. Release hands to fly over the low bar. Land arms over head (Underswing dismount over low bar).

Penalties for Beginner Level – Uneven Bars

I.	1. Hands in undergrip	.30
	2. Lack of a pump swing	up to .20
	3. Arms bent in straddle shoot	up to .30
	4. Leg lift over low bar under 45°	up to .30
	5. Knees bent	up to .20
	6. Heavy landing on low bar	.10
	7. Lack of extension in rear hand support	.10
II.	1. Bent knees	up to .20
	2. Legs not joined when hips contact bar	up to .20
	3. Jerky rotation (rebound)	up to .30
III.	1. Lack of extension in front support	up to .20
IV.	1. Arms bent during back drop	up to .40
	2. Hips dropped in pike	up to .20
	3. Ankles not at high bar	up to .40
	4. Lowering legs to low bar heavy	.10
	5. Bent knees	up to .20
V.	1. Legs apart during turn	up to .20
	2. Body not fully extended during turn	up to .20
	3. Lack of continuity in turn (between rear support hang and front support)	up to .20
VI.	1. Cast under the horizontal	up to .30
	2. Pike too early	up to .20
	3. Knees bent	up to .20
	4. Lack of extension at the finish of rotation	up to .20
VII.	1. Stop in front support before cast for leg cut	.40
	2. Cast too low	up to .20
	3. Leg touches bar	up to .20
	4. Failure to keep body off bar during the "cut"	.20
VIII.	1. Failure to lift before circle	up to .20

	2. Pike into stride circle	up to .30
	3. Legs bent	up to .20
	4. Altering the degree of stride in circle	up to .20
	5. Hips or legs out of line (twist)	up to .20
	6. Failure to stop circle with control	.20
IX.	1. Legs bent	.10
	2. Lack of continuity between: stride support-seat support – under swing	.20
X.	1. Cast ½ turn below the level of low bar	.50
	2. Body not extended	up to .40
	3. Turn before extension	up to .30
	4. Turn is not completed	up to .30
	5. Legs apart	up to .30
XI.	1. Swing and beat heavy	up to .20
	2. Pike premature	up to .20
	3. Back swing under the level of low bar	up to .30
	4. Grip change not in time	.10
XII.	1. Failure to extend knees in pike	up to .20
	2. Legs apart in pike	up to .20
	3. Heavy foot placement on low bar	up to .20
	4. Lack of continuity into stem rise	up to .20
	5. Free leg bent	up to .20
	6. Arms bent	up to .30
	7. Lack of extension in front support	up to .20
XIII.	1. Pausing before back drop	.20
	2. Arms bent	up to .50
	3. Lack of rotation around high bar	up to .30
	4. Bent knees	up to .20
	5. Off-Flight (too low or short) poor	up to .40
	6. Lack of extension in hips and shoulders	up to .30
	7. Landing heavy	up to .20
	8. Extra step after landing	.20

Beginner Level – Uneven Bars



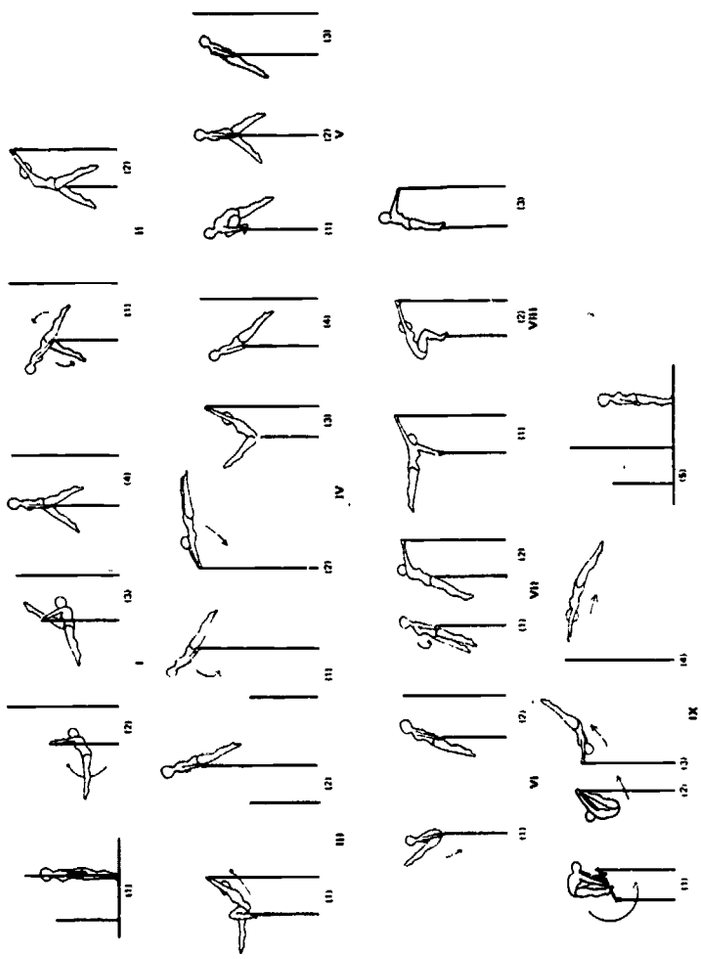
Intermediate Level — Uneven Bars

DELENE DARST

Delene Darst received her B.S. degree from Springfield College, Springfield, Massachusetts and her M.A. degree from Michigan State University, East Lansing. She participated in the Second and Fifth National Institutes on Girls and Women's Sports, has a DGWS-USGF national gymnastics officiating rating, and was manager judge for the women's gymnastic team at the 1970 World University Games. She is currently the Womens Gymnastics Chairman of the United States Collegiate Sports Council and USGF National Judges' Training Chairman.

I. *Mount:* Executed from a stand under high bar, facing low bar. Glide, single leg overshoot on right. (Crotch circle mount from a glide.)
II. Reverse grip and forward mill circle (split leg circle), right leg forward. Catch high bar with forward grip as complete circle.
III. Bring left leg over low bar straight and place foot on low bar. Execute a single leg stem rise to high bar.
IV. Make a forward hip circle on high bar facing low bar to cast out from high bar, back hip circle wrap on low bar to front support.
V. Do a single leg squat thru with left leg. Bring right leg around and cut right hand to sit on low bar (body extended).
VI. Lift weight off bar and perform a forward seat circle to extended position.
VII. Do a thigh roll to the left, (left hand on low bar, right hand on high bar), facing high bar.
VIII. Perform cast back and double leg squat up to low bar. Move left hand to high bar as you come to a stand.
IX. *Dismount:* Jump to a straddle sole circle on high bar, facing out. Drop back under low bar to bring legs together and arch out releasing hands to stand facing away from bars. Use back straddle circle underswing dismount.

Intermediate Level -- Uneven Bars



Penalties for Intermediate Level – Uneven Bars

I.	1. Lack of extension of glide	up to .20
	2. Bent knee on right leg	.20
	3. Lack of leg extension in finished position	.20
II.	1. Bent knees	up to .20
	2. Alternate catching of high bar	up to .30
III.	1. Bent left leg	.10
	2. Stem rise jerky	up to .20
	3. Bent arms	up to .20
IV.	1. Stopping before forward hip circle	.30
	2. Bent knees on hip circle	up to .20
	3. Bent arms on cast out	up to .30
	4. Jerky rotation on hip circle	up to .30
	5. Failure to open up in front support	up to .30
V.	1. Stopping before single leg squat thru	.30
	2. Right leg bent on cut	up to .20
VI.	1. Legs touching bar on circle	.20
	2. Knees bent	up to .30
	3. Arms bent	up to .30
	4. Insufficient amplitude on circle	.20
VII.	1. Lack of extension on thigh roll	.20
VIII.	1. Loss of balance on squat up	.20
	2. Placement of feet alternately	.20
IX.	1. Legs bent in sole circle	up to .40
	2. Insufficient elevation in straddle support	.10
	3. Insufficient amplitude on arch out	up to .40

Loop Films of the National Compulsory Routines for Women may be purchased from the Athletic Institute, 705 Merchandise Mart, Chicago, Illinois 60625.

Advanced Level — Uneven Bars

DELENE DARST

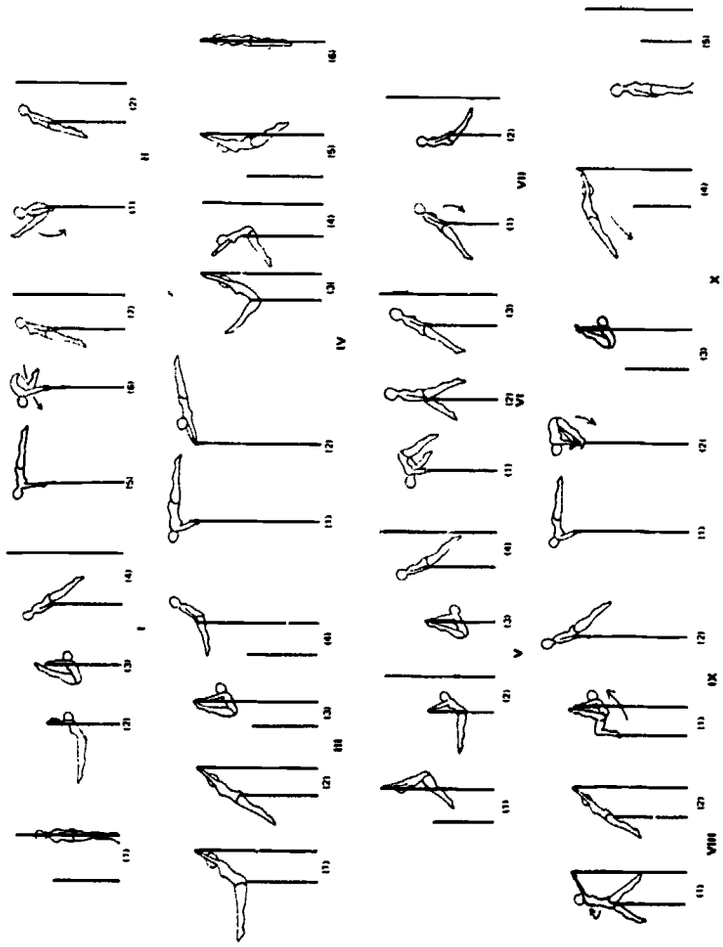
I. *Mount:* Executed from a stand under high bar, facing low bar. Jump to glide kip to immediate double leg squat thru opening body to extend position.
II. Perform a forward seat circle to extended position.
III. Reach back to grasp high bar in rear lying hang (Immediate kip to high bar).
IV. Cast back to swing down under high bar back hip circle wrap around low bar to an eagle catch.
V. Execute a drop glide straddle kip to low bar.
VI. Execute single leg squat thru on right leg, bring left leg around as you make ½ turn left to finish in a front leaning rest on low bar facing high bar.
VII. As soon as front support position is reached, execute a forward hip circle, hands on bar.
VIII. Lift right leg over low bar and cut right hand as it grasps high bar. Make ½ turn left as right leg is lifted up and over low bar to finish in rear lying hang on low bar, both hands on high bar.
IX. Execute a single leg stem rise to high bar with right foot pushing on low bar.
X. From stem rise to straddle sole circle under high bar continue out and over low bar. At highest point bring legs together, release hands, and execute ½ turn in either direction to stand facing low bar.

Penalties for Advanced Level – Uneven Bars

I.	1. Insufficient extension on glide	up to .30
	2 Arms bent	up to .20
	3. Stopping before squat thru	.30
	4. Feet hitting bar on squat thru	.20
	5. Insufficient extension after squat	.10
II.	1. Arms bent	up to .20
	2. Knees bent	up to .30
	3. Insufficient extension at completion of movement	up to .20
III.	1. Stopping in rear lying hang	up to .40
	2. Bent arms on kip	up to .30
	3. Lack of continuity	.20
IV.	1. Stopping before casting off	.30
	2. Insufficient amplitude on cast off	up to .30

	3. Lack of continuity in back hip circle	.20
	4. Lack of amplitude on eagle	up to .40
V.	1. Lack of continuity	.20
	2. Insufficient extension of glide	up to .30
	3. Arms bent	up to .20
VI.	1. Supplementary swing in order to execute squat thru	.50
	2. Lack of continuity in turn	up to .30
VII.	1. Legs bent on hip circle	up to .30
	2. Arms bent	up to .30
VIII.	1. Lack of continuity in leg cut and ½ turn	.20
	2. Insufficient amplitude of right leg	.10
IX.	1. Lack of continuity	.20
	2. Bent arms	up to .40
X.	1. Supplementary swing before casting to straddle position	.50
	2. Insufficient amplitude before straddling the legs	up to .40
	3. Bent legs	.20
	4. Insufficient amplitude on release of legs and ½ turn	up to .40
	5. ½ turn incomplete	.20
	6. Insufficient straightening of body before the landing	.20

Advanced Level — Uneven Bars



Compulsory Vaulting

ANDREA B. SCHMID

Andrea Schmid, DGWS Gymnastics Guide *chairman is an associate professor at San Francisco State College. She received gold and silver medals in the 1952 and 1956 Olympic games, has conducted numerous clinics and workshops, and was a member of the teaching staff for the Fifth National Institute on Girls and Women's Sports. She is co-author of the book* Gymnastics for Women, *1964, 1970.*

Each contestant is entitled to two attempts and the score of the better execution will be the one which counts. The compulsory vault will be evaluated from 0 – 10 points and divided in the following 5 categories: Pre-flight; Repulsion – Push Off; After-flight; Body Position during the Entire Vault; General Balance, Direction, and Landing.

The vault is zero (0.0) if it is interrupted completely by feet resting or by seated position on the horse, if it is assisted by the coach during the vault and/or if it is a wrong vault. A wrong vault and the resulting score of 0.0 would be declared if, for instance, a straddle is the compulsory vault and a squat is performed. This is considered a drastic change in the vault or wrong vault. But, if a compulsory vault involving the layout position is executed with a bent hip or horizontal position the 0.0 score for wrong vault is not to be applied. This is considered poor execution and the appropriate deductions must be taken as indicated below.

Beginner Level Vault: Bent Hip Straddle – 10.0 points

Table of Penalties

Pre-flight:	
Insufficient preflight between the board and the horse	up to 1.0
Failure to lift hips	up to 1.0
Coach between the horse and the board	1.0
Repulsion – push off:	
Failure to place hands on top of horse	up to 0.5
Bending the arms in support	up to 1.0
Alternate repulsion of the hands	up to 0.3
Late push off with hands	up to 0.5
After-flight:	
Failure to completely extend body before landing	up to 1.5

Body position:
- Straddling legs too soon ..... up to 0.5
- Touching the horse with feet ..... up to 0.5
- Failure to bring legs together before landing ..... up to 0.3
- Bending the legs ..... up to 1.0

General balance, direction, and landing:
- Poor direction of the vault ..... up to 0.5
- Landing on the floor heavy and uncertain 0.2
- Landing on the floor out of balance ..... up to 0.3
- Landing – touching the hands on the floor 0.5
- Landing – supporting the hands on the floor 1.0
- Landing – falling on the knees 1.5
- Landing – falling on the hips 2.0
- Landing – falling against the horse 1.5
- Landing – aid of coach 2.0

Intermediate Level Vault: Layout Squat – 10.0 points

Table of Penalties

Pre-flight:
- Insufficient pre-flight between the board and the horse ..... up to 1.5
- Body below horizontal when hands contact the horse or performing a bent hip squat vault 3.5
- Body at horizontal when hands contact the horse 2.0
- Body slightly above horizontal when hand contact the horse ..... up to 0.5
- Body slightly bent in pre-flight ..... up to 0.5
- Coach between the board and the horse 1.0

Repulsion – push off:
- Same as listed for bent hip straddle vault.

After-flight:
- Failure to completely extend body before landing ... up to 2.0

Body position:
- Touching the horse with feet ..... up to 0.5
- Squatting legs too soon ..... up to 0.5

General balance, direction, and landing:
- Same as listed for bent hip straddle vault.

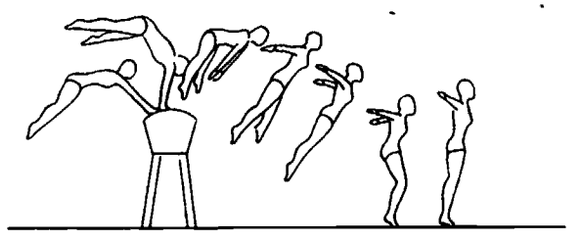
Advanced Level Vault – Handspring – 10.0 points

Table of Penalties

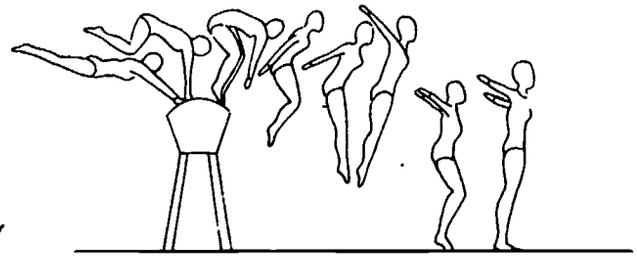
Pre-flight:
- Insufficient flight between the board and the horse ..... up to 1.5

During the flight body bent	up to 0.5
During the flight legs bent	up to 0.5
During the flight legs apart	up to 0.5
Using force to establish support	up to 1.0
Body bent before the inverted support	up to 1.0
Shoulders forward at the inverted support	0.5
Arms slightly bent at the support	0.3–0.5
Arms completely bent	2.5
Stop at the support	0.3–0.5
Coach between the board and the horse	1.0
Repulsion – push off:	
Lack of repulsion	2.0
Alternate repulsion of hands	up to 0.3
Removing hands too late	up to 0.5
Insufficient height of repulsion	1.0
After-flight:	
Insufficient flight	up to 2.0
During the flight, body bent	0.5
Legs bent	up to 0.5
Legs apart	up to 0.5
Body position:	
Penalties listed under pre-flight and after-flight.	
General balance, direction, and landing:	
Same as listed for bent hip straddle vault.	

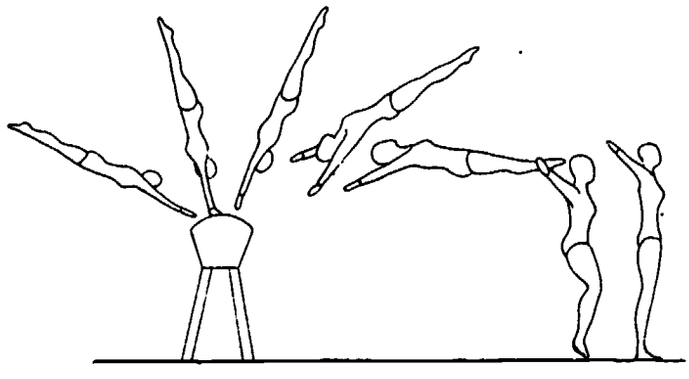
Beginning Level – Vaulting



Intermediate Level – Vaulting



Advanced Level – Vaulting



Annotated Gymnastics Bibliography

GLENDA ADAMS

Glenda Adams received her B.S. and M.Ed. degrees from North Texas State University, Denton and is currently working on a Ph.D. at the Texas Woman's University, Denton. She has been the DGWS chairman of Colorado and is a state-rated gymnastic judge. She teaches secondary physical education in the Jefferson County Public Schools, Lakewood, Colorado.

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JOHNSON, CHARLES R. *Procedures for Teaching Gymnastics in Physical Education Class.* Englewood, Colo.: Gym Master Co., 1970. For women and men with training and teaching hints, plus checklists and routines for all events.

KJELDSEN, KITTY. *Women's Gymnastics.* Boston: Allyn & Bacon, 1969. Excellent conceptual approach using mechanical analysis and guided exploration to basic skills and routine construction.

NORMAN, RANDI. *Gymnastics for Girls and Women.* Dubuque, Iowa: William C. Brown, 1965. Scandinavian approach to gymnastics, including tables of exercises to develop a comprehensive training program. Chapter on demonstrations.

O'GUINN, GARLAND. *Gymnastics for Elementary School Children.* Dubuque: William C. Brown, 1967. Excellent book with thorough explanations, progressions, and teaching notes. Basically for grades 1-5.

SJURSEN, HELEN SCHIFANO. *Girls' Gymnastic Workbook for Physical Educators.* n.d. Waldwick, N.J.: Hoctor Dance Records. Exercises and routines for each event for beginners, stressing form and control through scoring procedures.

———, ed. *Women's Gymnastics S and M Book.* 1970. Order from editor at 46 Poplar Place, Fanwood, N.J. 07023. Stick figures and brief explanation of superior and medium difficulties based on 1968 *FIG Code of Points.*

Single Events

BALEY, JAMES A. *An Illustrated Guide to Tumbling.* Boston: Allyn & Bacon, 1968. Tumbling skills, conditioning, principles, and spotting techniques.

EDWARDS, VANNIE M. *Tumbling.* Philadelphia: W. B. Saunders, 1969. Beginning to advanced skills with coaching points, practice hints, and spotting. Terminology section.

PRCHAL, MILDRED. *Artistic Gymnastics–Floor Exercises.* Waldwick, N.J.: Hoctor Dance Records, 1964. Well-analyzed combinations of movement for routines; excellent because of its fundamental nature.

PROVAZNIK, MARIE, and ZABKA, NORMA B. *Gymnastic Activities with Hand Apparatus for Girls and Boys.* Minneapolis: Burgess Publishing, 1965. Includes some modern gymnastics; graded activities with progressions.

SJURSEN, HELEN SCHIFANO. *Balance Beam for Physical Educators and Competitors.* Waldwick, N.J.: Hoctor Dance Records, 1966. Single stunts explained with spotting, many combinations, some routines.

——— *Educational Gymnastics Booklets: Balance Beam, Side Horse Vaulting, Uneven Bars, Parallel Bars.* Waldwick, N.J.: Hoctor Dance Records, 1967.

——— *Uneven Bars for Physical Educators and Competitors.* Waldwick, N.J.: Hoctor Dance Records, 1967. Beginning and low intermediate stunts.

Miscellaneous Sources

BALEY, JAMES A. *Gymnastics in the Schools.* Boston: Allyn & Bacon, 1965. Basic book covering history, teaching principles, equipment, public relations, skills, and lead-up activities.

GRANT, GAIL. *Technical Manual and Dictionary of Classical Ballet.* Rev. ed. New York: Dover, 1967. Pronunciation and description of all ballet terms, steps, and positions. Excellent for beginning instructors.

HALL, JUDITH. *Annotated Gymnastics Bibliography.* n.d. Order from author at Univ. of New Mexico, Women's Physical Education Dept., Albuquerque, N.M. 87106.

SPACKMAN, ROBERT R., JR. *Conditioning for Gymnastics.* Springfield, Ill.: Charles C. Thomas, 1970. For coach and trainer in all-around conditioning program, men and women. Many illustrations for warm-up and stretching of entire body plus isometric program.

TREIBER, MARGIT. *National Collegiate Directory: Women's Gymnastics.* Directory of universities and colleges offering courses and/or competitive women's gymnastics. Order from author at Indiana State Univ., Women's Physical Education Dept., Terre Haute, Ind. 47809. $2.50 per copy.

Periodicals

Federation Internationale de Gymnastique Bulletin. United States Gymnastic Federation, P.O. Box 4699, Tucson, Ariz. 85717. In French and English. $5.00

Gymnast Magazine. Sunby Publication, P.O. Box 611, Santa Monica, Calif. 90406. $7.50. This new magazine is a merger of *Mademoiselle Gymnast* and *The Modern Gymnast.*

Materials Available from USGF*

F.I.G. Code of Points for Women. Includes new (1971) supplement to the *Code.* $5.50.

F.I.G. Measurements and Dimensions. The official booklet from FIG with drawings and dimensions for all men's and women's apparatus. $2.00.

F.I.G. Quarterly Bulletin. Published quarterly in Switzerland. Latest revision and interpretations. $7.50 per year.

Gymnastique Moderne: Class III (Beginning Level). USGF compulsories for beginners with prescribed text, music, and drawings for each event. $1.50.

Gymnastique Moderne: Class II (Intermediate Level). USGF compulsories for intermediates with prescribed text, music, and drawings for each event. $1.50.

Gymnastique Moderne: FIG Technical Rules. Complete English interpretation of FIG rules for *Gymnastique Moderne* by Mildred Prchal, chairman, Modern Gymnastics Committee, USGF. $1.50.

National Compulsory Routines for Girls. The official USGF-DGWS routines now being used nationally by every organization. Music, text, and drawings for all levels. $1.50.

1972 Judging Guide for Women. Replaces old guides one and two. $3.00.

Rules and Policies for Women's Gymnastics. Official USGF Women's Committee publication for the conduct of all gymnastics events under USGF. $2.00.

USGF Newsletter. Initiated in 1972. The official word from the USGF Office concerning projects and latest developments in program and publications, meets, rule changes, etc. Published every other month. $5.00 per year.

USGF Women's Committee Bulletin. Membership in the USGF Women's Committee receive periodic news information as to rule changes and interpretations; local, regional, and national competitions and workshops; and judges' training and certification. Membership year: Sept. 1 to Sept. 1. $5.00 per year. Order from Shirley Bryan, Chairman, USGF Women's Committee, 421 W. St. James Pl., Chicago, Ill. 60614.

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*Order materials from The United States Gymnastics Federation, P.O. Box 4600, Tucson, Ariz. 85717.

Gymnastics Audiovisual Aids

BETH EVANS

Beth Evans received her B.S. and M.Ed. from Springfield College, Springfield, Massachusetts. She attended the University of Pennsylvania and received a certificate in physical therapy. She has coached high school gymnasts and has served as president of the Massachusetts Girls Gymnastics Association. As a judge she has participated on the local, state, regional, and national levels. Presently, she teaches at Springfield College.

Records

Hoctor Dance Records, Inc., Waldwick, N.J. 07463

Artistic Gymnastics. Mildred Prchal. Evelyn Navy, pianist. Especially selected for material in her book, *Artistic Gymnastics–Floor Exercise.* HLP 4006.

Authentic Floor Exercise Music. Series I and II. Janet and Rudy Bachna. Especially prepared for their teachers manual. Cynthia Parker, pianist. KLP 4040-4050.

Ball Gymnastics. Annelis Hoyman. Manual of moves and routines included. KLP 4030.

Balls and Ropes, vol. 1. *Clubs and Hoops,* vol. 2. Blanche Drury and Andrea Bodo Schmid. Adelia Spangenberg, pianist. HLP 4010.

Compositions for Floor Exercise. Dale Flansaas. HLP 4090.

Compositions for Floor Exercise. Dale Flansaas. Carmen Sorensen, pianist. Manual included with routines also music for 1970 World Championship Compulsory. HLP 4102.

Compositions for Floor Exercise. Dale Flansaas. Ronald Williams, composer-pianist. High intermediate and advanced. Dramatic and classical music. HLP 4119.

Contemporary Music for Floor Exercise. Reginald Hache. HLPS 4133.

Dance Combinations in Modern Gymnastics. Maria Bakos. HLP 4110.

Elementary Floor Exercise Routines for Boys and Girls 4, 5, & 6. Created by Richard Bramlish. KLP 9030.

Favorite Tunes. Helen Sjursen, coordinator. Paul Kueter, pianist. Beginners to advanced. HLP 4093.

Floor Exercise Music for Competitors. Margit Treiber. Ed Luse, pianist. Manual of rhythmic structure for each number. Dynamic music for all levels. HLP 4123.

Floor Exercises for Girls and Women. Helen Schifano Sjursen. Paul

Keuter, pianist. Manual, worksheet, and routines included. HLP 4014.

Floor Exercises for Women. Blanche Drury and Andrea Bodo Schmid. Adelia Spangenberg, pianist. HLP 4011.

Gymnastics with Muriel Grossfeld. Patricia Melcher, pianist and arrangements. Record and manual. Beginners to advanced. KLP 6040.

Music for Competitive Free Exercise. Directed by Dick Zuber. Gene Cipriano, pianist. HLP 3090.

Music for Gymnasts. Mimi Murray. Notes with record. HLPS 4134.

Music for Intermediate and Advanced Floor Exercise. Kitty Kjeldsen. Anthony Crescione, pianist. HLP 4067.

Music for Streamers. Maria Bakos. Manual included. HLPS 4129.

Rhythmic Gymnastics. Hoops and Indian clubs. Annelis Hoyman. Manual for hoops and manual for Indian clubs. KLP 5040.

Wall Charts and Cards

Gymnastic Action Cards. Prepared by Bruce A. Frederick. Minneapolis: Burgess Publishing, 1965.

Gymnastic Aids. Prepared by Don Tonry, P.O. Box 475, Northbridge, Mass. 01534.

Gymnastics Posters, Sundby Publications, 410 Broadway, Santa Monica, Calif. 90401.

Wall Charts, Teaching Manuals. Prepared by Richard Zuber. Nissen Corp., Cedar Rapids, Iowa.

Films

Advanced Tumbling. 16mm, 10 min., sd., b&w and color. Free loan (2).

Aerials–Tumbling–Floor Exercises for Girls. 16 mm, 22 min., sd., b&w. Sale $95, rental $8 (10).

Beginning Tumbling. 16mm, 10 min., si., b&w. Rental $2.25 (5).

Floor Exercise–Balance Beam–Uneven Bars. 16 mm/Super-8/Super-8 cartridges, 18 min. ea., si./sd., color. Sale or rental (12). Includes teaching booklet.

Grace in Motion. 16mm, 10 min., sd., b&w. Free loan. Sale $40 (7).

Gymnastic Flashbacks. 16mm, sd., b&w., color. Sale $120, rental $10 (13).

Gymnastics for Girls. 1965. 16mm, 30 min., sd., color. Rental $7.50 (1).

Hi-Low Bars: Uneven Parallels. 16mm, 18 min., sd., b&w. Sale $80, rental $6 (10).

*The prices listed above are subject to change. The numbers in parentheses refer to film distributors, p. 137.

Modern Gymnastics: 1967. Super-8, color. Three-day rental $6 (14). Third World Championship from Copenhagen, Denmark.

Modern Gymnastics. 1969. Super-8, color. Three-day rental $7.50 (14). Individual exercises and team exhibitions at the World Gymnastrada in Basel, Switzerland.

National Compulsory Routines for Girls. Super-8 cartridge loops, color (8).

1970 USGF National Championship. (Women's). Super-8, 225 ft., color. Sale $24 (11). Includes 1970 World Compulsories.

Olympic Games. (Women finalists). 1968. 200 ft., 8mm, b&w. $10 (6).

Olympic Games 1968. Super-8, 400 ft., color (4). Shows top six women finalists in each event.

Olympic Games 1972. Super-8, 200 ft., color. Sale $18 (4). Women's Compulsories #23.

Olympic Games 1972. Super-8, 305 ft., color. Sale $31 (4). Women's Finals #25: Top four to six competitors, each event.

Olympic Games 1972. Super-8, 280 ft., color. Sale $25 (4). Women's Team Optionals #24—includes those who did not make the finals.

Rhythmic Ball Exercises. Sale $145 (3).

III Modern Gymnastics World Championships. 1968. 400 ft. Sale $35 (6).

USA Final Olympic Trials. 1972. Super-8, 375 ft., color. Sale $30 (4). Women's #21: Top five optional routines, each event.

World Gymnastic Championships. (Women's). 16mm, 400 ft., b&w. Sale $40 (9). Order Film No. WG-2.

Women's Gymnastic Series. 1) *Balance Beam*—46 ft., 2) *Even Parallel Bars*—43 ft., 3) *Uneven Parallel Bars*—45 ft., 4) *Free Exercise and Vaulting*—46 ft. Color. Sale $44.35 (8). Includes a study guide.

Filmstrips

Gymnastics for Girls and Women. 35mm, sd., color (8).
Trampolining. 35mm, sd., color (8).
Tumbling. 35mm, sd., color (8).
Tumbling Advanced. 35mm, sd., color (8).

Film Distributors

1. Association Films, Inc.: (Central Area) 561 Hill-Grove Ave., La Grange, Ill. 60525; (Eastern Area) Broad at Elm, Ridgefield, N.J. 07657; (Western Area) 25358 Cypress Ave., Hayward, Calif. 94544; (Southern Area) 1621 Dragon St., Dallas, Tex. 75207.
2. Audio-Visual Film Library, University of Illinois, Urbana, Ill. 61801.

3. Cal-Fin Productions, Box 763, Cupertine, Calif. 95014.
4. Frank Endo, 12200 Berendo, Los Angeles, Calif. 90044.
5. Florida State University, Audio-Visual Film Library, Tallahassee, Fla. 32302.
6. Glenn Sundby, 410 Broadway, Santa Monica, Calif. 90401.
7. Sports Film Library, U.S. Olympic Committee, Olympic House, 57 Park Ave., New York, N.Y. 10016.
8. Athletic Institute, 105 Merchandise Mart, Chicago, Ill. 60654.
9. World's Games Films (G) USGF, P.O. Box 4699, Tucson, Ariz. 85717.
10. Film Rental Library, Syracuse University, 1455 E. Colvin St., Syracuse, N.Y. 13210.
11. USGF Film '70, Box 777, Santa Monica, Calif. 90406.
12. Visual Communications, 1714 N.W. Overton, Portland, Ore. 97204 or Cascade Films, 2254 N.W. Lovejoy, Portland, Ore. 97210.
13. Pyramid Films, P.O. Box 1048G, Santa Monica, Calif. 90406.
14. Agnes Vidovic, Mayfair Campus, Chicago City College, 4626 N. Knox, Chicago, Ill. 60630.

ARE YOU A MEMBER OF AAHPER-DGWS? If not, now is the time to join and get involved. For complete information, write AAHPER Consultant in Girls and Women's Sports, 1201 16th St., N.W., Washington, D.C. 20036.

Officiating Services Area

OSA (Officiating Services Area)–This area, one of seven in the DGWS structure, is devoted to the training and rating of officials. Its Executive Board, which meets annually prior to the AAHPER national convention, is composed of:

1. A *chairman,* a *chairman-elect,* and a *past chairman.* The chairman-elect is elected in an open meeting at the national convention.
2. A *secretary,* who sends rating cards to boards and receives applications for new boards. She is elected by mail ballot in alternate years by the local boards of officials.
3. A *treasurer,* who is responsible for collecting board dues. She also is elected by mail ballot in alternate years by the local boards of officials.

P & T of O (Principles and Techniques of Officiating)–This committee is concerned with the methods used by referees, umpires, and judges to officiate games and matches. The P & T of O chairman is a member of and is selected by the Executive Board. A subcommittee in each sport is responsible for evaluating and revising the officiating techniques and for writing the Techniques of Officiating article published in its respective sports guide. Membership is by appointment. If you have questions concerning the techniques of officiating, write to the appropriate P & T of O chairman.

E & R (Examinations and Ratings)–There is an E & R committee for each of the nine sports in which ratings are given. Each chairman and her committee are responsible for preparing, revising, and analyzing the officiating theoretical examinations. The general chairman and an associate chairman (who is the E & R chairman-elect) coordinate the subcommittees and compile the general material for the sports packets. The chairman of E & R is an appointed member of the OSA Executive Board. If you need information regarding the study questions in the Guides or a question in the examination, write to the appropriate E & R chairman.

E & P (Editorial and Publications)–This committee is responsible for editing the OSA portion of the Guides. The chairman is appointed for a two-year term of office and is a member of the Executive Board.

DOC (District Officiating Coordinator)–There is one DOC in each of the six districts of AAHPER. She serves as liaison between the boards of officials in her district and the OSA Executive Board.

The DOC is elected at her AAHPER district convention and serves on the Executive Board.

Boards (Affiliated and Provisional Boards of Women Officials)–These boards are made up of organized groups of women throughout the United States who are authorized to give ratings. A listing of these boards follows.

OFFICIATING EXECUTIVE BOARD
1973-1974

Chairman: MARY ROLAND GRIFFIN, Winthrop College, Rock Hill, S.C. 29730 (1973-74)
Past Chairman: ELSIE J. COBB, North Texas State Univ., Denton 76203 *(1973-74)*
Chairman-elect: MARY BELL, Northern Illinois Univ., DeKalb 60115
Secretary: VIRGINIA HUNT, College of Wooster, Wooster, Ohio 44691

Chairmen of Standing Committees

Principles and Techniques of Officiating: PATRICIA DUNCAN, 409 N. Elmwood, Kansas City, Mo. 64123
Examinations and Ratings: JACKIE SHICK, Univ. of Minnesota, Minneapolis 5545[illegible]
Associate Chairman: NANCY LAY, Univ. of Tennessee, Knoxville, Tenn. 37916
Editorial and Publications: KAREN JOHNSON, California State College, Los Angeles, Calif. 90032 (1973-75)

District Officiating Coordinators

Central: WANDA GREEN, Univ. of Northern Iowa, Cedar Falls 50613 (1972-74)
Eastern: BETTY LOGAN, Rampo College of N.J., Mahwah, N.J. 07430
Midwest: NORMA JEAN JOHNSON, Indiana Univ., Bloomington 47401
Northwest: JEAN NEELY, Eastern Oregon College, La Grande 97850 (1972-74)
Elect: MARLENE ADRIAN, Washington State Univ., Pullman 99163
Southern: AILEEN BRITTON, Edward White Senior High School, Jacksonville, Fla. 32210 (1972/74)
Elect: ALETHA W. BOND, Auburn Univ., Auburn, Ala. 36830
Southwest: FERN GARDNER, Utah State Univ., Logan 84321 (1972-74)

Canadian Representative

PATRICIA LAING, Pelham St. S., Fonthill, Ontario

Advisory

MARY E. REKSTAD, *AAHPER Consultant, Division for Girls and Women's Sports,* 1201 16th St., N.W., Washington, D.C. 20036

FRANCES KOENIG, *DGWS Vice President*, Central Michigan Univ., Mt. Pleasant 48858

JOANNA DAVENPORT, *Chairman, DGWS Sports Guides and Official Rules Committee*, Univ. of Illinois, Urbana, Ill. 61801

CHARLOTTE WEST, *Former Past Chairman, OSA*, Southern Illinois Univ., Carbondale 62901

PRINCIPLES AND TECHNIQUES OF OFFICIATING COMMITTEE

PATRICIA DUNCAN, *Chairman*, 409 N. Elmwood, Kansas City, Mo. 64123

Elect: ANNE J. WINTER, Univ. of Wisconsin, Lacrosse 54601

Badminton: JEAN PANKONIN, Illinois State Univ., Normal 61761

Basketball: SHIRLEY DUNCAN, 9313 Winbourne Rd., Burke, Va. 20015

Gymnastics: DELENE DARST, 7678 Cathedral Hill Dr., Cincinnati, Ohio 45244

Softball: ELSIE WULF, Franklin Township Junior High School, Wanamaker, Ind. 46239

Swimming: NANAY J. O'CONNOR, Colorado State Univ., Ammons Hall, Ft. Collins 80521

Synchronized Swimming: HOLLIS C. SZABO, Univ. of Vermont, Burlington 05401

Tennis: ANNE PITTMAN, Arizona State Univ., Tempe 85281

Track and Field: BONNIE PARKHOUSE, Univ. of Minnesota, Minneapolis 55455

Volleyball: KAY CORCORAN, College of Mt. St. Joseph, Mt. St. Joseph, Ohio 45051

EXAMINATIONS AND RATINGS COMMITTEE

JACKIE SHICK, *Chairman*, Univ. of Minnesota, Minneapolis 55455

Badminton: JEANETTE WIESER, Sam Houston State Univ., Huntsville, Texas 77340

Basketball: RITA SMITH, 9873 McBroom St., Sunland, Calif. 91040

Associate: FLORA BRUSSA, East Los Angeles College, Los Angeles 90022

Gymnastics: VARINA FRENCH, Rte. 1, Box 245, Forest Grove, Ore. 97116

Associate: SUE AMMERMAN, 97 Lions Head East, Wayne, N.J. 07470

Tennis: CLAUDIA GIACOMINI, Sequoia High School, Redwood, City, Calif. 90263

NANCY LAY, *Associate Chairman,* Univ. of Tennessee, Knoxville 37916

Softball: DONNA LAPINANO, 877 E. 24th St., Brooklyn, N.Y. 11210

Swimming: ANN FULLILOVE, Women's Gym 12, Univ. of Texas, Austin 78712

Synchronized Swimming Co-Chairmen: ANNE WINTER, Wisconsin State Univ., La Crosse 54601

Track & Field: MARY ALLEN, Concordia College, Moorhead, Minn. 56560

Volleyball: JOANNE FORTUNATO, Brooklyn College, Brooklyn, N.Y. 11210

Associate: CAROL WACKER, 2301 Benson St., Philadelphia, Pa. 19152

GYMNASTICS PRINCIPLES AND TECHNIQUES OF OFFICIATING COMMITTEE

DELENE DARST, *Chairman,* 7678 Cathedral Hill Dr., Cincinnati, Ohio 45244

JUDY HALL, Univ. of New Mexico, Albuquerque, N.M. 87106

JOANNE PAQUALE, 204 S. Annin Ave., Fullerton, Calif. 92631

GYMNASTICS EXAMINATIONS AND RATING COMMITTEE

VARINA FRENCH, *Chairman,* Rt. 1, Box 245, Forest Grove, Ore. 97116

BETTY BENISON, Univ. of New Mexico, Albuquerque, N.M. 87106

HARRIETT CARNES, Ithaca College, Ithaca, N.Y. 14850

DELENE DARST, 7678 Cathedral Rd., Cincinnati, Ohio 45244

CHRISTINE KELLER, 11227 38th St., N.W. Canton, Ohio 44709

SHIRLEY VEECK, 752 Oriole, Eugene, Ore. 97401

How To Establish A Rating In Gymnastics

The Gymnastics Rating is a joint rating administered by the Women's Gymnastics Certification Committee of the DGWS and the USGF (United States Gymnastics Federation).

Established Boards of Women Officials may qualify to give DGWS officials ratings in gymnastics by listing three qualified persons who are willing to establish and maintain gymnastics ratings. The qualifications, such as experience in the sport and possible other ratings, should be listed. These names should be sent to the Gymnastics Examinations and Ratings Chairman, Varina French, Rt. 1, Box 245, Forest Grove, Ore. 97116.

Certified boards and approved USGF individuals *only* may rent the rating film. The rating film is rented for a three-day period. To obtain the rating film, send a request to the nearest Association Film Company, listing *three* dates. Send a carbon copy of this letter to the Examinations and Ratings Associate Chairman and request the examination packet from her. Upon confirmation of the rating film request, the film and examination packet will be sent prior to the administration date.

It is suggested that the Athletic Institute 8 mm loop films in floor exercise, balance beam, uneven parallel bars, and vaulting be used in training judges for DGWS-USGF compulsory phases of gymnastics. The training film may be rented for a five-day period.

Sources of Film Rentals

Rating of Judges for Girls Gymnastics: 16mm.; b&w; 728 ft.; sound on floor exercise section; $10 for a three-day period. (Available only to certified Boards of Women Officials.)
Order from the Association Films, Inc.,
561 Hillgrove Ave., La Grange, Ill. 60535

Rating Examination Costs

Film Rental: $10
Minimum per administration: $18 (exclusive of film rental)
Minimum per examinee: $3
Expenses for duplicating written examinations may be deducted.

STANDARDS FOR OFFICIALS RATINGS IN GYMNASTICS**
Effective June 1973

National Official

*1. Minimum grade – theoretical examination; 90%
*2. Minimum grade – practical examination; 90%
3. Age – 20
4. Duration – until December 1976 (throughout the Olympiad) Must judge three meets per year or a total of six meets within a two-year period to maintain status.
5. Recommended minimum fees – $10.00 per session, transportation, and $15.00 per diem
6. Qualified to judge any competition with the exception of the Elite Division in any geographical area.

Regional Official

*1. Minimum grade – theoretical examination; 80%
*2. Minimum grade – practical examination; 80%
3. Age – 18
4. Duration – until December 1976 (throughout the Olympiad) Must judge three meets per year or a total of six meets within a two-year period to maintain status.
5. Recommended minimum fees – $7.50 per session and transportation.
6. Qualified to judge any competition with the exception of the Elite Division in any geographical area.

State Official

*1. Minimum grade – theoretical examination; 70%
*2. Minimum grade – practical examination; 70%
3. Age – 18
4. Duration – until December, 1976 (throughout the Olympiad) Must judge three meets per year or a total of six meets within a two year period to maintain status.
5. Recommended minimum fees – $7.50 per session and transportation.
6. Qualified to judge any competition with the exception of the Elite Division in any geographical area.

**See page 150 for additional ratings.

REGISTRATION OF OFFICIALS

A number of states require those who officiate either boys or girls interscholastic contests to be registered with the State High School Athletic Association or other administrative body. Holding a DGWS

*Minimum % score for both theoretical and practical must be met for rating level.

rating ordinarily does not exempt an official from complying with this regulation.

All DGWS officials who officiate any high school or junior high school games are urged to cooperate fully with their state regulatory body by registering with the proper organization and paying any required fee, by wearing the official emblem in addition to the DGWS emblem, and by complying with all requirements for sports officials.

AMATEUR STANDING OF OFFICIALS

An official who wishes to maintain her amateur status as a participant in a sport must be aware of the ruling(s) on amateur status established by the governing body for that sport.

Amateur status may be defined by groups governing high school and college level competition. National organizations governing amateur competition may also have established rulings on the amateur status of the participant.

The official who wishes to maintain her status as a participant is responsible for investigating the specific regulations of the governing body who has jurisdiction over her eligibility as a participant.

HOW TO BECOME A RATED OFFICIAL

1. Study the rules, the article on the techniques of officiating, and the study questions.
2. Attend interpretations meetings and officiating clinics or training courses conducted in your vicinity.
3. Practice often. To some, officiating comes easily; to others it comes only as the result of hard work and concentration. Welcome criticism and work hard to improve.
4. Find out from the chairman of the nearest affiliated board when examinations for ratings are to be held. (Consult list of boards.)
5. Remember that it is the aim of the Officiating Services Area to maintain a high standard for National officials. Do not be discouraged if you do not receive a Regional or National rating on your first attempt. Welcome suggestions from the examiners, practice more, and try again.

INFORMATION FOR AFFILIATED AND PROVISIONAL BOARDS

An *affiliated* board is a board which has at least three State officials in a given sport; it is authorized to give ratings at all levels in that sport.

A *provisional* board is a board which has at least three Apprentice officials in a given sport; it is authorized to give ratings at the Intramural and Apprentice levels in that sport. There are no provisional boards in gymnastics.

Exceptions: When OSA rating films are used as a medium for the practical rating (synchronized swimming and gymnastics), boards may award ratings at any level.

An Officiating Board may have *affiliated* status in one or more sports and/or *provisional* status in one or more sports. When a Board has *affiliated* or *provisional* status in a sport and wishes to have affiliated and/or provisional status in another sport, that board should write the Examinations and Rating (E.&R.) Chairman of the respective sport. The board should indicate the names of a minimum of three persons qualified to act as examiners in that sport for the next two years. Qualifications and experience in the sport should be listed for each examiner.

NOTE: For basketball and volleyball an examining committee of three State officials is required. No specific number of rated officials is needed to initiate ratings in Badminton, Gymnastics, Softball, Swimming, Synchronized Swimming, Tennis, and Track and Field. The Board Chairman should make application to the Chairman of the Gymnastics Examinations and Ratings Committee. The Gymnastics Examinations packets will be mailed when the rating film booking has been confirmed.

Emblem and Uniform

The emblem for National officials in all sports consists of a shield. Other emblems are available for State, Apprentice, and Intramural officials.

The official shirt for badminton, basketball, fencing, swimming, tennis, track and field, and volleyball is a navy blue and white striped tailored shirt or a navy blue and white striped jersey. The shirt for softball shall be navy blue. A navy blue shirt, shorts or slacks appropriate for the activity should be worn with the shirt. In badminton, fencing, swimming and tennis white may be substituted for the navy blue. A navy blue blazer may complete the uniform if desired. Officials who receive fees for officiating are required to wear the official shirt.

The official shirts and emblems are available from The Hanold Company, Sebago Lake, Maine 04075. The company can also pro-

vide approved blazers. When ordering, send dress size and check or money order for correct amount. Anyone may order the official shirt. A current rating card must accompany an individual's order for an emblem; however, it is not necessary to send a rating card when ordering a shirt.

An affiliated board may wish to have a supply of shirts or emblems for distribution to newly rated officials. A quantity order may be placed *only* by the affiliated board chairman. It is not necessary that the chairman enclose her own rating card, but full payment must accompany the order.

Prices: Wash-and-wear shirt $5.50; knit jersey with zipper neck, $8.50; knit jersey with button neck $12.00; doeskin blazer, $28.00; National emblem, $1.75; State, Apprentice, and Intramural emblems, $1.

Shipping Charge: 75 cents per order.

HOW TO ESTABLISH A BOARD OF OFFICIALS

1. Establish the need for an affiliated board by contacting women in the area who have current ratings or who are interested in standardizing and raising the level of officiating adminton, basketball, gymnastics, softball, swimming, tennis, track and field, or volleyball in that area.
2. Write to the Officiating Services Area Secretary, listed in the Officiating Services Area section of this *Guide*, for a sample copy of an authorized constitution for officials' boards and the *Policies and Procedures Handbook* and application for becoming an affiliated board.
3. At a designated meeting of interested women, present plans for forming a board.
   a. Choose a name which will permit expansion of function as need may arise; do not limit title to one sport.
   b. From the group, elect a chairman, chairman-elect, secretary, and treasurer.
   c. Form an examining committee of at least three members. If any member has been rated elsewhere, her experience should be helpful; such a rating is not necessary, however, except in basketball and volleyball. (See 4 below.) It is suggested that members of the examining committee be examined and obtain ratings from other affiliated boards whenever possible.
   d. Make plans for drawing up a constitution according to the sample copy received from the Officiating Services Area. Plan to devote some time to the study of the rules and to practice officiating. If possible, secure the assistance of some

rated official in each sport for which the Board anticipates giving ratings.

4. Send to the Officiating Services Area Secretary the completed application form, two copies of the local constitution, and a check for $5 annual dues (made payable to the Officiating Services Area). If *basketball or volleyball* ratings are to be given, an affiliated board must send a list of three State or National officials, and a provisional board must send a list of three officials with at least an Apprentice rating. Photostatic copies of rating cards for all officials should accompany the application form. A list of three interested women must be sent if the board wishes to give ratings in sports other than basketball or volleyball. If a board wishes continued affiliation in any sport, at the end of two years, an affiliated board will be required to have at least three State or National officials; a provisional board will be required to have at least three officials with at least an Apprentice rating. Approval of the application will come from the Officiating Services Area Chairman who will request that examination packets be sent to your Affiliated Board Chairman for all sports in which your Board is authorized to give ratings. The process of accepting an application for affiliation of a new Board and of requesting that the proper examination packets be sent ordinarily takes several weeks. Prospective Boards, therefore, should file for affiliation at least a month before they wish to hold rating sessions.
5. Administer Form A of the National Theoretical Examination. Form B of the National Theoretical Examination may be administered to those who did not pass Form A.
6. To cover expenses involved in the construction and evaluation of written examinations, boards should charge a fee each time an individual takes an OSA written examination.

   The OSA Treasurer should receive 50 cents for each written examination given by a board. Board fees can exceed 50 cents per test in order to cover operating expenses.
7. Conduct practice sessions in rating officials. All persons on the examining committee who have not previously rated officials should have a minimum of three practice sessions prior to actually rating. Secure the assistance of a rated official in these practice sessions if at all possible.
8. Give practical examinations to individuals who pass the written examination. These should be conducted by three members of the examining committee.
9. Request appropriate rating cards from the OSA Secretary for distribution to those who pass the theoretical and practical examination.

10. Send lists of approved officials to schools and other organizations in the area. This notice should indicate the fees for officiating in accordance with the OSA policy and should give the name, address, rating, and telephone number of each official.
11. Keep accurate lists of all persons receiving ratings. Forward these lists to the chairmen of the Examinations and Ratings Committees in those sports in which your Board was authorized to give ratings.

WOMEN'S GYMNASTICS CERTIFICATION COMMITTEE OF THE DGWS-USGF

SHIRLEY BRYAN, *Chairman,* 2619 North Hampden Court, Chicago, Ill. 60614

Standing Committee Chairmen:

Certification Coordinator: SHARON WILCH, 6357 W Mississippi Place, Lakewood, Colo. 80226
Committee on Written Examinations: VARINA FRENCH, Route #1, Box 245, Forest Grove, Ore. 97116
Committee on Practical Examination: JACKIE FIE, PO Box 312, Jefferson, Iowa 50129
Committee on Compulsory Routines: DELENE DARST, 7678 Cathedral Hill Rd., Cincinnati, Ohio 45244
Committee on Policies and Procedures: SUE AMMERMAN, 97 Lions Head Drive East, Wayne, N.J. 07420

Additional Ratings

Associate Official:

*1. Minimum grade – theoretical examination; 60%
*2. Minimum grade – practical examination; 60%
3. Age – 16
4. Duration – until December 1976 (throughout the Olympiad) Must judge three meets per year or a total of six meets within a two-year period to maintain status.
5. Qualified to judge any sectional or local competition with the exception of the Elite Division.

Apprentice Official:

*1. Minimum grade – theoretical examination; 50%
*2. Minimum grade – practical examination; 50%
3. Age – 16
4. Duration – Until December 1976 (throughout the Olympiad) Must judge three meets per year or a total of six meets within a two-year period to maintain status.
5. Qualified to judge any local competition with the exception of the Elite Division.

SOURCES OF INFORMATION AND MATERIAL

Information Needed	Source
Board Policy	Officiating Services Area Chairman
Policies and Procedures Handbook	Officiating Services Area Secretary
Rules interpretation	DGWS rules interpreter for each sport. Secure the name from the current *Guide* of the sport.
Creating a new board	Officiating Services Area Secretary
Adding sports	Officiating Services Area Chairman
Dues	Officiating Services Area Treasurer
Officiating standards for each sport	Chairman of the Principles and Techniques of Officiating Committee

Materials Needed	Source
Rating cards	Officiating Services Area Secretary
Examination material	Examinations and Ratings Chairman for the sport in which examinations are desired
DGWS *Guides*	DGWS-AAHPER, 1201 Sixteenth St., N.W., Washington, D.C. 20036
Uniforms and emblems	The Hanold Company, Sebago Lake, Maine 04075

Officiating Services Area officers are listed under Officiating Executive Board in this *Guide*.

AFFILIATED BOARDS OF OFFICIALS
1972-1973

All Boards of Women Officials affiliated with the Officiating Services Area are listed by districts on the following pages. Names and addresses of board personnel are included. For the names and addresses for the specific sport chairmen other than basketball, consult the appropriate DGWS *Guide.* Upon request, the board chairman will supply a list of names, addresses, and telephone numbers of rated officials who are members of the board.

Sports for which a board is authorized to give ratings are listed for each board. An asterisk after a sport indicates that the board has provisional status in that sport and can award only Apprentice and Intramural ratings. The board has affiliated status in each sport and can award any rating from the Intramural to the National level, except for those sports designated by an asterisk.

Where it is indicated that the annual report was not received, the Examinations and Ratings chairman will not send the current examination packet to the board chairman until she receives the annual report.

CENTRAL DISTRICT

District Officiating Coordinator: Wanda Green,
Univ. of Northern Iowa, Cedar Falls, Iowa 50613 (1972-74)

IOWA

Iowa Board of Women Officials

Chairman: Frances Leimkuehler, Black Hawk College, Moline, Ill. 61265

Chairman-elect: Barbara Wedeking, J. B. Young High School, Davenport, Iowa 52840

Ratings given in Gymnastics, basketball*, synchronized swimming, swimming.

KANSAS

Topeka Board of Women Officials

Chairman: Peggy Marmet, 3724 W 30th Terrace, Topeka 66614

Chairman-elect: Rhonda Horner, 817 Lincoln, Topeka 66614

Rating given in gymnastics, volleyball*.

MINNESOTA

Minnesota Board of Women Officials
Chairman: Ruth Christianson, 4042-26th Ave. South, Minneapolis 55400
Ratings given in basketball, swimming, gymnastics, synchronized swimming, volleyball.

Red River Valley Board of Women Officials
Chairman: Betsey McDowell, Bemidji State College, Bemidji 56601
Ratings given in basketball, gymnastics*, track and field*, volleyball.

Southwestern Minnesota Board of Women Officials
Chairman: Jane Roberts, Mankato State College, Mankato 56001
Chairman-elect: Mary Willerscheidt, Mankato State College, Mankato 56001

Ratings given in basketball, volleyball, gymnastics*, swimming*.

EASTERN DISTRICT

District Officiating Coordinator: Betty Logan, Ramapo College of N.J., Mahwah, N.J. 07430 (1973-75)

CONNECTICUT

Connecticut Central Board of Women Officials
Chairman: Joan F. Sullivan, Simsbury High School, Simsbury 06070
Chairman-elect: Frances Pinhey Mitchell College, New London 06320
Ratings given in basketball, gymnastics, volleyball

Greater New Haven Board of Women Officials
Chairman: Louise Albrecht, 500 Cresent Street, New Haven 06515
Ratings given in basketball, gymnastics, softball, swimming, track and field,* volleyball.

DISTRICT OF COLUMBIA

District of Columbia Board of Women Officials
Chairman: Barbara Drum, 9799 Good Luck Drive #5, Seabrook, MD 20801
Ratings given in basketvall, gymnastics, softball, swimming, volleyball.

Central Maine Board of Women Officials and Coaches
Chairman: Anita Ramsdell, Winthrop High School, Winthrop 04364
Chairman-elect: Shirley Fenalson, Route 2, Oakland 04963
Ratings given in basketball, gymnastics.

MASSACHUSETTS

Boston Board of Women Officials
Chairman: Janice Bruce, 310 Lowell Street, Reading 01867
Ratings given in basketball, gymnastics, softball, track and field, volleyball.

Greater Springfield Board of Women Officials
Chairman: Martha Van Allen, Sycamore Street, Apt. 22 Westfield 01085
Chairman-elect: Charlotte Miller, 40 Mountainview Dr. Hampden 01036
Ratings given in basketball, gymnastics*, volleyball*.

NEW JERSEY

Jersey Shore Board of Women Officials
Chairman: Harriet Lea, 733 Holly Berry Lane, Lake Wood, 08701
Ratings given in basketball, gymnastics*.

North Jersey Board of Women Officials
Chairman: Doris Meyer, 52 Ryder Lane, New Brunswick 08816
Ratings given in basketball, gymnastics, softball, swimming, track and field, volleyball.

NEW YORK

Capital District Board of Women Officials
Chairman: Claudia Alexander, 104 S Street, Ballston Spa 12020
Ratings given in basketball, gymnastics, softball*, volleyball.

Central New York Board of Women Officials
Chairman: Doris Kostrinsky, P.E., Women, Ithaca College, Ithaca 14850
Ratings given in basketball, gymnastics, softball, swimming, track and field, volleyball.

Central Western New York Board of Women Officials
Chairman: Shirley Bowen, 895 Wheatland Center Road, Scottsville 14546
Ratings given in basketball, gymnastics, swimming, volleyball.

Finger Lake Board of Women Officials
Chairman: Betty Lacey, Auburn High School, Lake Ave, Auburn 13021
Chairman-elect: Karen Stadeck, Auburn High School, Lake Ave Auburn 13021
Ratings given in basketball, gymnastics*, softball*, tract and field*, volleyball.

Long Island Board of Women Officials
Chairman: Marie Jensen, 20 Pond Road, Woodbury 11797
Chairman-elect: Patricia McMullen, 132 Herbert Ave, Lindenhurst 11757
Ratings given in basketball, gymnastics, softball, swimming, volleyball.

Metropolitan Board of Women Officials
Chairman: Linda Chencinski, 36-36 172nd St., Flushing 11358
Ratings given in gymnastics.

New York Board of Women Officials
Chairman: Grace M. Rosa, 162-10 Powells Cove Blvd., Whitestone 11357
Ratings given in basketball, gymnastics, softball, swimming, track and field,* volleyball.

Suffolk Board of Women Officials
Chairman: Terry Fishberg, 5 Country Squire Court, Dix Hills 11746
Chairman-elect: Patricia L. Burns, 281 S Bayview Ave, Amityville 11701
Ratings given in basketball, gymnastics, softball, volleyball.

PENNSYLVANIA

Central Pennsylvania Board of Women Officials
Chairman: Sue Allison, 14 Widmann Circle, State College 16801
Chairman-elect: Bobbie Testa, Bucknell Univ., Lewisburg 17837
Ratings given in basketball, gymnastics, volleyball.

Philadelphia Board of Women Officials
Chairman: Eleanor Snell, Lucas Road, Route 2, Phoenixville 19460
Ratings given in basketball, gymnastics, softball, swimming, volleyball.

VERMONT

Vermont Board of Women Officials
Chairman: Ruth Paul, 71 Cayuga Ct., Burlington 05401
Ratings given in basketball, gymnastics, softball*, volleyball.

MIDWEST DISTRICT

District Officiating Coordinator: Norma Jean Johnson, Indiana Univ., Bloomington, Ind. 47401 (1973-75)

ILLINOIS

Central Illinois Board of Women Officials
Chairman: Barbara Cothern, 1214 Searle Drive, Normal 61761
Ratings given in badminton, basketball, gymnastics*, softball, swimming*, track and field*, volleyball.

Northern Illinois Board of Women Officials
Chairman: Judith Kretzschmar, 7301 West Fullerton, Elmwood Park 60635
Chairman-elect: Judith Kretzschmar (same as above)
Ratings given in basketball, gymnastics*, softball, swimming, track and field*, volleyball.

Southern Illinois Board of Women Officials
Chairman: Kay Brechtelsbauer, Parktowne Gardens, Building B, Apt. E, Carbondale 62901
Ratings given in basketball, gymnastics, volleyball.

Indiana Lakes Board of women Officials
Chairman: Ruth Gunden, 1911 Woodward Place, Goshen 46526
Ratings given in basketball, gymnastics*, volleyball.

Noblesville Board of Women Officials
Chairman: Betty Heppner, 5115 E 79th Street, Indianapolis 46250
Chairman-elect: Jan Brown, 6173 N Park Ave., Indianapolis 46250
Ratings given in gymnastics*, volleyball, tract and field*.

MICHIGAN

Central Michigan Board of Women Officials
Chairman: Charlotte A. Denman, 4444 State A-303, Saginaw 48603
Ratings given in basketball, gymnastics, swimming, volleyball.

OHIO

Cleveland Board of Women Officials
Chairman: Judy Bruning, Cleveland Heights High School, 13263 Cedar Rd., Cleveland Heights 44118
Ratings given in basketball, gymnastics, softball, synchronized swimming, track and field, volleyball.

Youngstown Area Board of Women Officials
Chairman: Joan Philipp, 893 Glen Park Rd., Youngstown 44512
Ratings given in basketball*, gymnastics, track and field*.

WISCONSIN

Fox River Valley Board of Women Officials
Chairman: Helen H. Briwa, University of Wisconsin, Oshkosh 54901
Ratings given in basketball, gymnastics, swimming, track and field, volleyball.

LaCrosse Board of Women Officials
Chairman: Lee Stephenson, Wittich Hall University of Wisconsin, LaCrosse 54601
Ratings given in basketball, gymnastics, swimming, synchronized swimming, track and field, volleyball.

NORTHWEST DISTRICT

District Officiating Coordinator: Jean Neely, Eastern Oregon College, La Grande, Ore. 97850

OREGON

Northern Oregon Board of Women Officials
Chairman: Virginia Neal, Lewis & Clark College, Portland 97207
Ratings given in basketball, gymnastics, swimming, tennis, track and field, volleyball.

Willamette Valley Board of Women Officials
Chairman: Sylvia Moore, Oregon State University, Corvallis 97331
Ratings given in basketball, gymnastics, synchronized swimming, volleyball.

SOUTHERN DISTRICT

District Officiating Coordinator: Aileen Britton, Edward H. White Sr. High, 1700 Old Middleburg Rd., Jacksonville, Fla. 32210 (1972-74)

MISSISSIPPI

North Mississippi Board of Women Officials
Chairman: Jill Upton, Mississippi State College for Women, Columbus 39701
Ratings given in basketball*, gymnastics, softball*, volleyball, swimming, tennis.

SOUTH CAROLINA

Rock Hill Board of Women Officials
Chairman: Bobbie Lou Rogers, Jcamestowne Apt. D-39, Columbia 29208
Ratings given in basketball, gymnastics*, volleyball.

SOUTHWEST DISTRICT

District Officiating Coordinator: Fern Gardner, Utah State University, Logan, Utah 84321 (1972-74)

CALIFORNIA

Central California Board of Women Officials
Chairman: Beverly England, 2344 Moraine Circle #3, Rancho Cordova 95670
Ratings given in basketball, softball*, swimming*, volleyball, gymnastics*.

Coastal Valley Board of Women Officials
Chairman: Denise Lowe, 1142 Dinapoli Dr., San Jose 95129
Ratings given in basketball, softball, swimming, volleyball, gymnastics*.

Marin County Board of Women Officials
Chairman: Beth Juri, 114-A Hawthorne Ave., Larkspur 94939
Ratings given in basketball*, gymnastics, swimming*, volleyball*.

San Diego County Board of Women Officials
Chairman: Beverly Smith, 1566 LaConta, Lemon Grove 92045
Chairman-elect: Margaret Davis, 5311 Wellesly, LaMesa 92041
Ratings given in basketball, gymnastics.

San Francisco Bay Counties Board of Women Officials
Chairman: Judith J. Steele, 4736 El Centro Ave., Oakland 94602
Ratings given in basketball, gymnastics, swimming, volleyball.

San Joaquin Board of Women Officials
Chairman: Diana Perry, 735 E Noble Ave., Apt. 2, Visalis 93277
Chairman-elect: Lydia Cantrell, 487 West Scott, Fresno 93705
Ratings given in basketball, gymnastics, volleyball.

NEW MEXICO

New Mexico Board of Women Officials
Chairman: Maria Allison, Gallup High School, Gallup 87301
Ratings given in basketball, gymnastics*, swimming, volleyball.

Techniques of Officiating Gymnastics

Revised by the PRINCIPLES AND
TECHNIQUES OF OFFICIATING COMMITTEE

The following descriptions of techniques for gymnastics officials are intended to supplement the official rules. It is important, therefore, that all the sources be consulted for complete understanding of rules and officiating techniques. The interpretation of rules plus the FIG Code of Points, should be used as the supplements to the techniques stated below.*

PART I. SUGGESTED OFFICIALS FOR A MEET

SECTION 1.

Officials for a dual or three-way meet:

1 superior judge
3-4 acting judges (depending on whether the superior judge is also used as one of the acting judges)
1 chief scorer
2 assistant scorers
1 announcer
1 or 2 timers
2-4 runners

Officials for a larger meet:

1 meet director
1 meet referee
1 to 4 superior judges (depending on the number of events run at one time
3 to 16 acting judges (depending on the number of events run at one time and whether or not the superior judges are also used as acting judges)
1 to 4 clerks (depending on the number of events run at one time)
1 chief scorer
2 to 8 assistant scorers
1 to 2 announcers (if two events are to be run alternately, it is best to have two announcers, one covering each event)
1 to 4 timers (depending whether the beam and floor exercise are

F.I.G. code of Points: Available from United States Gymnastics Federation, P.O. Box 4699, Tucson, Arizona 85717, $5.00.

to be run simultaneously and whether one or two timers per event are used)
At least 2 runners per event

SECTION 2.

The meet director shall–

a. Send out entry blanks at least two months in advance
b. Obtain the facilities and gymnastics equipment for running the meet:
   1. Gymnasium with all necessary apparatus
   2. Special warm-up area for larger meets with identical apparatus
   3. Lockers and locker room for the competitors
   4. Changing area for coaches and officials (preferably another locker room)
   5. Seating arrangements for spectators
   6. Seating area for teams
   7. Chairs and tables for announcers, scorers and score flashers
   8. Chairs for judges, runners and timers
   9. P.A. system, stop watches, paper, pencils
   10. Record player, tape recorder and/or piano
   11. Gymnastics chalk, batter's rosin and fine sandpaper
   12. Tape measure to check the apparatus
   13. Flash card(s)
   14. Awards and prominent people to present them (not necessary for dual meets)
   15. Equipment movers during the meet, if any equipment moving is necessary
c. Have received the names of entries at least two days before the meet (unless a definite deadline for entries was set) and draw the order of competition (drawn at random)

Note: In duel meets, the girls will compete alternately in the order sent in by the coaches of the teams. The visiting team has the choice of event(s) to go last in.

d. Designate such persons as she deems necessary to assist her in her duties
e. Obtain judges and all other officials
f. Determine the suitability of all apparatus and supervise its placement
g. Prepare lists of competitors for scorers, announcers, clerks, and superior judges. Prepare worksheets for acting judges
h. Provide for a trainer, nurse, or physician to be present at the meet

i. Duplicate the results of the meet and mail them to interested parties

Note: In case of dual meets, these duties shall be assumed by the home coach or person(s) designated by her.

SECTION 3.

The meet referee shall–

a. See that all the rules and regulations are enforced, and have the power to disqualify competitors or judges for serious infractions or extremely unsuitable conduct
b Decide on all matters not covered by the rules
c. Rule on all protests
d. Meet with judges and coaches (separately or combined) immediately prior to the meet for necessary clarifications of rules and difficulties
e. Check all apparatus for regulation height, width or distance

Note: In dual meets, the duties of the referee may be assumed by the superior judge in addition to her own assignments.

SECTION 4.

The superior judge shall–

a. Assign the acting judges to their places, apart from each other, and preferably on all sides of the performing area
b. Determine when the acting judges are alert and attentive and
c. Conduct a consultation of the judges after the first performance in each individual event in order to establish a common basis for scoring the performances
d. Counsel the judges on any gross variations in compulsory exercises
e. Counsel the judges on any gross inadequacies of an exercise
f. Consult with an acting judge when requested by the acting judge
g. If the two middle scores are out of line according to the FIG point spread for preliminary or final competition, the superior judge should call a conference, review the routine, and give her score. The middle score furthest from the score of the superior judge must adjust, so that the scores will fall within the accepted range. The range is determined by the superior judge's score.

Example: Preliminary Point Differences

1. Superior Judges Score – 7.4 (1.0 range)
   Middle Scores – 6.5 and 7.6
   The 6.5 score must adjust to at least 6.6 to bring the scores in line.
   Average – 6.6 and 7.6 = 7.1

2. Superior Judges Score – 8.9 (.5 range)
   Middle Scores – 9.0 and 8.4
   The 8.4 score must adjust to at least 8.5 to bring the scores in line.
   Average – 9.0 and 8.5 = 8.75

The average score must also be in line with the score of the superior judge according to the FIG point difference.

	Superior Judge's Score	*Average Score*
Prelims	9.5 – 10.0	Within .30
	8.5 – 9.45	.50
	Below 8.5	1.00
Finals	9.5 – 10.0	.20
	8.5 – 9.45	.30
	7.0 – 8.45	.50
	Below 7.0	1.00

If the average score is out of line with the score of the superior judge, the gymnast's score is computed in the following manner:
1. The 2 middle scores are averaged.
2. This average score is added to the score of the superior judge.
3. This total is divided by 2 to arrive at the final or *base score* for the gymnast. This is the official score.

Example: Final Point Differences

	Superior Score	*Average Score*	*Base Score*
Case #1	9.8 (.2 range)	9.5	19.3/2 = 9.65
Case #2	9.0 (.3 range)	8.6	17.6/2 = 8.80
Case #3	9.1 (.3 range)	9.5	18.6/2 = 9.30

In case of protest the Meet Referee may alter the score to the base score, if she feels, after consultation with the judges, that the change is justified.

h. Supervise the timers during the events in which they are active.

i. Subtract from the competitor's average, if necessary, deductions for:
   1. Time infractions
   2. Going out of bounds in floor exercise
   3. Improper attire
   4. Coach talking to or making signals to the gymnast while she is performing
   5. Gymnast taking an extra warmup during judges' conference
   6. Gymnast failing to present herself to the head judge at the beginning of her exercise

j. Take on the duties of a meet referee in dual and three-way meets.

SECTION 5.

The acting judges shall–

a. Be familiar with the rules and difficulty ratings
b. In case of compulsory meets, be thoroughly familiar with the compulsory exercises and their specific deductions
c. Arrive at least 30 minutes before the starting time of the meet
d. Follow the directions of the superior judge
e. Mark independently and without communicating with the other acting judges, except in cases of conferences called by the superior judge
f. During short breaks in competition, stay in the proximity of the gymnasium and avoid any contact with coaches, competitors, or parents of the competitors. (All protests or questions should be referred to the superior judge.)
g. Be as impartial and objective as possible
h. Stay alert during long periods of judging
i. Be able to justify her score, if called upon to do so, and have all major deductions as well as the number of superior and medium difficulties listed on her worksheet.
j. Give credit for all work done up to the point of cessation if at any time an exercise is not finished
k. Come up with her score within 30 seconds of the end of the exercise
l. Not be a parent, coach, or teammate of a gymnast in the meet.

SECTION 6.

The clerk shall–

a. Be provided with the names of all contestants in order of their performance for each event
b. Check the contestants for each event, and notify them of the order in which they perform
c. Be responsible for alerting the performer at the proper time for each event, and generally expedite the meet

Note: In large meets, it is helpful to have a separate clerk for each event. In case of dual meets, the duties of the clerk(s) are assumed by the coaches or managers of the teams.

SECTION 7.

The chief scorer shall -

a. Supervise all scoring and act as auditor of the average score
b. Be provided with worksheets for each event
c. Supervise the recording of all scores to ascertain that all marks are

recorded correctly and that the score is credited to the proper contestant and to the proper judge

d. When the final results of each event are posted, supervise the placing of the contestants' marks in accordance with the official rules
e. As the final results of each event are determined, prepare a statement for the meet director including the winner of each place and the average score awarded
f. At the completion of the meet, compute the scores for the All-Around event and prepare a statement for the meet director on the winners of the event
g. Audit the scoresheet and turn it over to the meet director.

Note: In dual meets, the chief scorer shall give the results of the competition, as they are completed, to the announcer, who will announce them to the public.

SECTION 8.

The announcer shall–

a. Announce the order of the contestants for each event, call each contestant to report for his turn, and alert contestant next in line
b. Publicize the results of each event after they have been checked by the chief scorer
c. Refrain from making personal announcements unless a true emergency exists.

Note: In large meet situations, the announcer shall only open the meet, introduce the officials, and announce the order of events and the results of each event. Alerting the competitors at the proper time becomes the job of the clerks. At the conclusion of the competition, the announcer shall read the results of the meet.

SECTION 9.

The timer(s) shall–

a. Operate watches for the following events:
   1. *Floor exercise.* The timers will start their watches at the moment the competitor starts moving to music at the beginning of her exercise. After 1 minute 25 seconds, a warning signal should sound, loud enough to be heard over the music of the exercise. At 1 minute 30 seconds the signal should sound again, but the watches should not be stopped. The watches are stopped when the competitor stops moving at the end of her exercise.

2. *Balance beam.* The timers will start their watches at the moment the competitor's feet leave the ground or Reuther board. After 1 minute 40 seconds, a warning signal should sound. At 1 minute 45 seconds, the signal should sound again, but the watches should not be stopped. The watches are stopped when the competitor's feet touch the ground at the end of her dismount. The watches are not stopped during the time the competitor spends on the ground following a fall.
3. *Floor exercise and balance beam.* If the girl has finished her exercise before minimum time, the timers should notify the head judge. There is a .05 deduction for each second under the minimum time. In case of overtime (going past the second signal), the judges will stop looking at the exercise as the second signal sounds. The work done after the signal is not counted, and the penalty for overtime is .3. The superior judge should be notified by the timers. She will make the necessary deductions.
   Exception: If, on the balance beam, the second signal sounds after the girl has left the beam but before she has arrived on the floor, there will be no deduction for overtime.

b. Time the duration of the falls as follows:
   1. In *balance beam,* a girl has 10 seconds to remount in case of a fall. One of the two timers should be designated to pay close attention to the exact time the competitor falls off, and call out "exercise terminated" if she has not remounted within 10 seconds.
   2. In *uneven bars,* a girl has 30 seconds to remount and continue with her exercise after she has fallen off. A special timer should be assigned to the bars for this task. She activates the watch when the competitor's feet touch the ground in the fall and stops the moment her feet leave the ground again. If more than 30 seconds have elapsed, she calls out "exercise terminated."
c. Sound the warning signals at the proper time.
d. Notify the superior judge in case time infractions occur.
e. Notify the competitor or her coach upon request only. The request should be made through the superior judge before the start of the event.

PART II. SCORING IN A GYMNASTICS MEET

SECTION 1.

Judges' worksheets

a. Worksheets should be given out to every acting judge and the superior judge.

b. The worksheets should include the names of the competitors in their competitive order and space for listing deductions, difficulties, and the final score. Judges should also be provided with small pads of paper which they can use in sending in their final scores.

JUDGES WORKSHEET

Name of judge_____	Event_____	
Competitor_____	Difficulty	(4.0) ____
	Originality	(1.5) ____
	Composition	(0.5) ____
	Execution	(1.5) ____
	Amplitude	(1.5) ____
	General impression	(1.0) ____
	Subtotal	
	Spotting, Falls	____
	Final Score	____

Figure 1. Sample judge's worksheet
(floor exercise, balance beam, uneven bars)

In side horse vaulting, *judges* use a different worksheet (see Fig. 2). The *scorers* worksheets for vaulting are similar to the ones used in other events, but should be made large enough for two sets of scores to fit into each square. In the 'Average' column, the better average of the two vaults should be circled and counted as the competitors score for the vaulting event.

SECTION 2.

Scorers worksheets

a. Scorers worksheets (also called score sheets) should be available to the clerks, scorers, and coaches of the teams. One of the copies, designated as the official score sheet, should be checked by the chief scorer and meet director before final results are announced.

JUDGES WORKSHEET

VAULTING

Name of the judge _____

Competitor _____ Vault value _____

Preflight _____

On horse _____

Push off _____

Afterflight _____

Landing _____

Gen. balance & direction _____

Subtotal _____

Spotting _____

Total _____

Figure 2. Sample judge's worksheet (side horse vaulting)

GYMNASTICS COMPETITION SCORE SHEET

_____ vs. _____

Date _____ Time _____ Place _____

Judges: Event _____

Superior _____

2 _____

3 _____

4 _____

Name	School	Judges Scores 1	2	3	4	Home Team Averages	Visitors Averages	Place

Figure 3. Sample scorer's worksheet Optional exercises

The score sheet shown in Figure 3 is designed for dual meet competition in optional exercises only. For a triangular meet, add another column for visitors' averages of the third team, and enter the names of the teams in the appropriate columns.

For meets involving both compulsory and optional exercises, it is recommended that scorers use the score sheet shown in Figure 4.

GYMNASTICS COMPETITION SCORE SHEET

(name of the meet)

Date_____ Time_____ Place _____

Judges: Event _____

Superior_____

2_____

3_____

4_____

Name	School	Judges Scores 1	2	3	4	Average	Total	Place
		C						
		O						

Figure 4. Sample scorer's worksheet
Compulsory and optional exercises

SECTION 3.

Determining the average

a. The average score of the gymnast is determined by crossing off the highest and the lowest scores awarded by the judges and averaging the middle two.
b. In case fewer than four judges are used, all the scores should be averaged.

SECTION 4.

Determining the team score.

a. For dual or triangular meets, each team can enter any number of competitors, provided the number of gymnasts entered exceeds the number of scores counting for the team total. The recom-

mended number of scores to count in each event is three. The team score is the total of the designated number of scores from floor exercise, balance beam, vaulting, and uneven bars.

b. In larger meets (state, regional, etc.), the number of entries from each team can be decided by the meet director. The recommended number, however, is four per team per event, with the top three scores counting for the team total. In this case, the top three scores earned by the girls of a team in each event will be totaled for the event score. The total of four event scores makes up the team score.
c. In meets where both compulsory and optional exercises are used, the team will earn two scores – one for compulsory exercises and one for optional exercises. The scores can be added for the final team score.

SECTION 5.

Determining the all-around score.

a. The average scores earned by a girl in vaulting, uneven bars, balance beam and floor exercise will be totaled for her all-around score.
b. In meets where both compulsory and optional exercises are used, a girl earns two all-around scores – one for compulsory exercises and one for optional exercises. These scores can be added for her final all-around score.
c. Winning the all-around does not add to the team point total. It is an individual honor.

SECTION 6.

Determining the scoring method.

a. Both open and closed scoring methods are acceptable in meets below national championship level.
b. National and International meets should use the closed method suggested by FIG.
c. *Explanation of the methods.*
Closed method. Judges arrive at their scores independently. Runners carry the scores to the head judge, who determines whether they are in range. Then the scores are carried to the scorers' table. From here, the scorers take over, working out the averages and recording the scores on their worksheets. The public does not see the individual judge's score, only the average.
Open method. Judges arrive at their scores independently. The scores are sent or flashed to the superior judge. After determining that the scores are in range, the superior judge signals to the flashers and the scores are shown to the public. Scorers copy the

scores from the flash cards as they are shown, working out the averages.

d. In each case, the competitor's average is flashed from the scorers' table after it has been computed and double-checked.
e. The meet should not be held up for the average to be flashed. If necessary, it can be announced after the next girl has completed her routine.
f. To save time in vaulting events, only the best average of the two is flashed to the audience.* However, the coach or spotter of a girl can request, before the first vault is executed, that the head judge inform her of the average of the first vault, if this could be instrumental in selecting another vault for her second attempt.

PART III. ORDER OF EVENTS

SECTION 1.

Large open meets.

a. The order of events for large open meets should be determined by the availability of space, the number of entries per event, and the number of events run at one time. Any practical combination is acceptable, as long as it is known to the competitors ahead of time.

SECTION 2.

Dual and triangular meets.

a. In dual and triangular meets, the following order of events has been accepted by most areas since it corresponds with the international rules:
   Vaulting
   Uneven parallel bars
   Balance beam
   Floor exercise

PART IV. EQUIPMENT AND PERFORMING AREAS

SECTION 1.

Measurements and dimensions.

a. The dimensions of the apparatus specified here are those published by the International Gymnastics Federation. Variations from these measurements may be approved by mutual agreement of the parties involved, provided they meet the standards.

*This will work only with the closed scoring method. If the open method is used, all scores should be flashed.

b. The measurements here include both the metric and the linear measurements. The linear measurement is based upon the conversion of one centimeter equaling 0.03937 of an inch and one meter equaling 39.37 inches, figured to the nearest tenth of an inch.

c. *Floor exercise.* The dimension of the area shall be a minimum of 12 m x 12 m (39'4½" x 39'4½") clearly marked with white lines in an area of at least 14 m x 14 m (45' 11 3/16" x 45' 11 3/16"). Indoor area should be a wooden floor without grooves. It is recommended that the construction be a double elastic floor covered with soft material such as a carpet of soft felt 5 mm (3/16") thick and covered with canvas for protection. If the competition is held outdoors, a lawn is prepared and contestants shall have the choice of lawn or wooden floor.

Note: Special floor exercise mats, put out by equipment companies, are acceptable as long as their overall measurements are correct.

d. *Uneven (asymmetric) parallel bars.* The height of the upper bar shall be 2.30 m (7' 6 9/16"), measured from the top of the bar to the floor. The height of the lower bar shall be 1.50 m (4' 11 1/16"). The bars shall be placed on a level and stable foundation with fastenings to the floor or ground where possible. If fastening is not possible, the base shall be suitably weighted to prevent movement. The area beneath the bars shall be padded sufficiently for safety and to provide a soft landing.

e. *Balance beam.* The height of the beam shall be 120 cm (3' 11¼") measured from the floor to the top of the beam. The length shall be 5 m (16' 4"). The cross-section of the beam shall be: thickness at widest part, 130 mm (5 1/8") and 100 mm (3 15/16") at upper and lower margins; depth, 160 mm (6 5/16"). The finish on the beam should be of natural lacquer with the surfaces smooth and without splinters or bumps. The walking surface should not be slippery. The beam must be placed on a level and stable foundation. The supports should be constructed to provide maximum stability and not to interfere with the performer in any way. If possible, the supports should be fastened to the floor or ground. The area beneath the beam shall be padded sufficiently to ensure safety and provide a soft landing.

f. *Vaulting horse.* The height of the horse shall be 1.10 m (3' 7 5/16"), measured from the floor to the top of the horse at the saddle. The vaulting horse should be placed on a level and stable foundation and where possible, fastened to the floor or ground. The area on the landing side of the vaulting horse shall be padded sufficiently to afford a soft landing.

g. *The Reuther-type elastic board.* The length of the board shall be

1.20 m (47¼"). The width shall be 60 cm (23 5/8") and the height 12 cm (4¾"). The Reuther-type board should be used if at all possible.

h. *Mats.* The mats may be up to 4" in thickness.

Notes: Thickly padded Reuther boards are not accepted for women's competition and should be used for training only. A carpet covered Reuther board, available from most major equipment companies, will be required soon in all major competitions.

FIG suggests that countries use their native rather than imported equipment, providing that the equipment meets FIG specifications.

A carpet covered balance beam is being tried out by several countries. It could be the beam of the future.

Gymnastics Study Questions

1973-75

Revised by the Gymnastic
Examinations & Rating Committee

PART I: Optional Routines – read each question carefully and select the one best foil which answers the question.

1. In preliminary competition, the difference between an 8.0 average of the 2 middle scores and the score of the superior judge must not be more than
   a. 0.20
   b. 0.30
   c. 0.50
   d. 1.00
2. The point value of the layout stoop vault is
   a. 8.00
   b. 8.50
   c. 9.00
   d. 10.00
3. The deduction for heavy and uncertain landing in executing a vault is
   a. 0.10
   b. 0.20
   c. 0.30
   d. 0.50
4. In vaulting, the penalty for aid by the coach during the vault is
   a. 0.50
   b. 1.00
   c. 1.50
   d. vault is voided
5. The deduction for the feet brushing the floor heavily during a glide-kip is
   a. 0.10
   b. 0.20
   c. 0.30
   d. 0.50
6. Which of the following is a *superior* element?
   a. free front hip circle mount
   b. glide-double leg shoot-rear kip

c. front seat circle
d. free back hip circle to a long hang

7. The dominant factor in uneven bar composition is
   a. swing
   b. difficulty
   c. changes from bar to bar
   d. changes in direction

8. The penalty for executing a leap on the balance beam without amplitude is
   a. 0.10
   b. 0.20
   c. 0.30
   d. 0.50

9. If the gymnast supports her leg on the side of the beam to maintain balance, the deduction is
   a. 0.10
   b. 0.20
   c. 0.30
   d. 0.40

10. The deduction for unnecessary movements of the trunk in order to maintain balance on the beam is
    a. 0.10
    b. 0.20
    c. 0.30
    d. 0.50

11. Which of the following is a *superior* element in floor exercise?
    a. dive roll
    b. roll backward to handstand
    c. roll forward, somersault forward
    d. roll forward, after a handstand followed by a leap or jump

12. The deduction for a fall on the floor during a floor exercise routine is
    a. 0.50
    b. 1.00
    c. 1.50
    d. 2.00

13. In floor exercise, the first signal in time will warn the gymnast at
    a. 1 minute 10 seconds
    b. 1 minute 15 seconds
    c. 1 minute 25 seconds
    d. 1 minute 30 seconds

PART II: Compulsory Routines

1. The deduction for failure to lift hips during the pre-flight of the bent hip straddle beginner level vault is
   a. 0.20
   b. 0.30
   c. up to 0.50
   d. up to 1.00
2. The deduction for squatting legs too soon during the layout squat intermediate level vault is
   a. up to 0.30
   b. up to 0.50
   c. up to 1.00
   d. up to 1.50
3. The deduction for using force to establish support in the handspring, advanced level vault is
   a. up to 0.30
   b. up to 0.50
   c. up to 1.00
   d. up to 1.50
4. The deduction for a stop in front support before cast for leg cut in the beginner level uneven bar routine is
   a. 0.10
   b. 0.20
   c. 0.30
   d. 0.40
5. The deduction for insufficient amplitude on arch out during dismount of the intermediate level uneven bar routine is
   a. up to 0.30
   b. up to 0.40
   c. up to 0.50
   d. up to 1.00
6. The deduction for insufficient extension on glide during the advanced level uneven bar routine is
   a. up to 0.20
   b. up to 0.30
   c. up to 0.50
   d. up to 1.00
7. The deduction for trunk in "V" seat during the beginning level balance beam routine is
   a. 0.10
   b. 0.20

c. 0.30
d. 0.50

8. The deduction for tardy release of the hands after the roll before the "V" seat position in the intermediate level balance beam routine is
   a. 0.10
   b. 0.20
   c. 0.30
   d. 0.50

9. The deduction for uncertain landing during the dismount of the advanced level balance beam routine is
   a. 0.10
   b. 0.20
   c. 0.30
   d. 0.50

10. What is the penalty for failing to scissor the legs during the beginning level floor exercise routine?
    a. 0.10
    b. 0.20
    c. 0.30
    d. 0.50

11. During the intermediate level floor exercise routine, if the execution of the lunges is not quick and sharp the deduction is
    a. 0.10 (each time)
    b. 0.20 (each time)
    c. 0.30
    d. 0.50

12. During the advanced level floor exercise routine, if the jump with ronde jambe is omitted the deduction is
    a. 0.20
    b. 0.30
    c. 0.50
    d. 1.00

For Answers and Rule References, see page 24.

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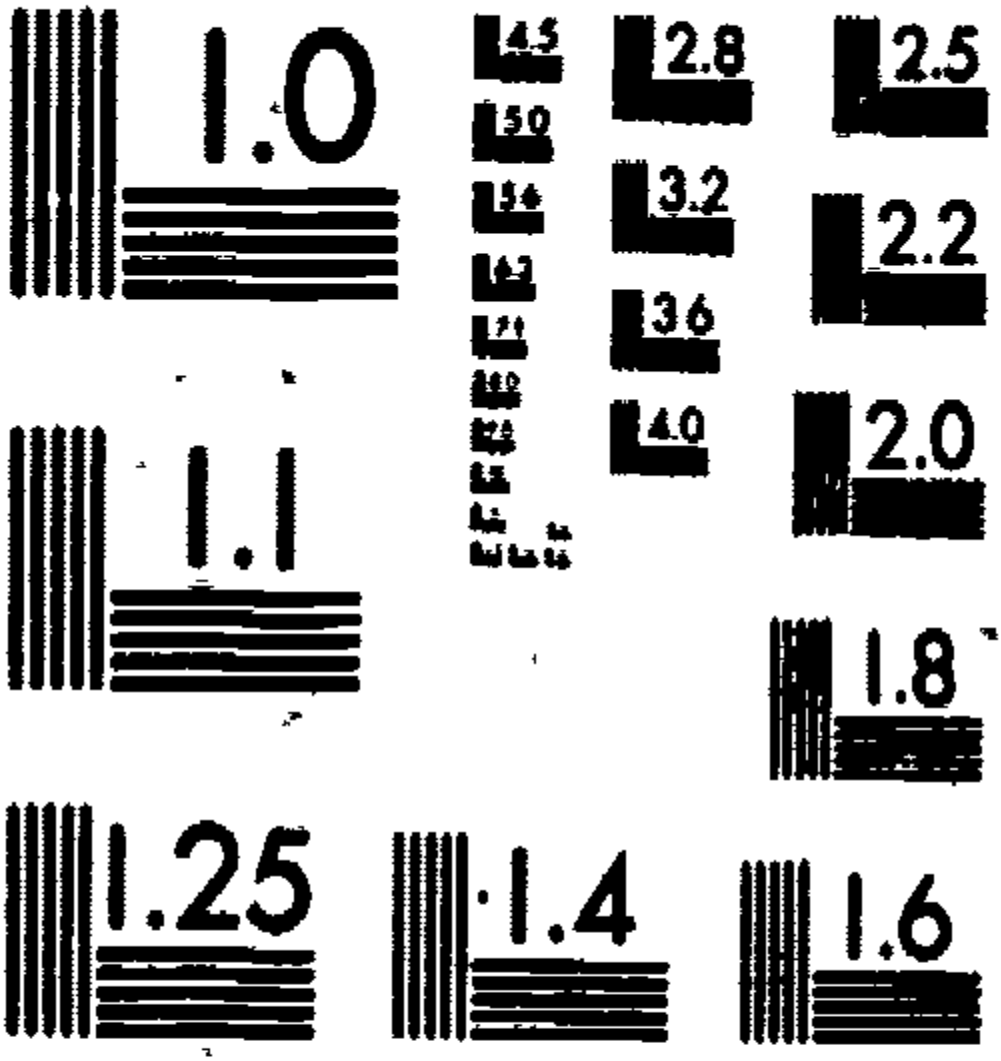

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ABSTRACT

This document is a collection of author abstracts of 129 papers scheduled for presentation at the 1973 Minneapolis convention of the American Association for Health, Physical Education, and Recreation. The papers are roughly grouped in clusters according to subject, but time limits and conflicting schedules prevented rigid subject content headings. The volume is author-indexed. (JA)

ABSTRACTS

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Presented at the Minneapolis Convention of
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PREFACE

This volume of Abstracts of Research Papers 1973 includes abstracts, precisely as submitted by the authors, of the 129 papers scheduled for presentation at the 1973 Minneapolis convention. Although an attempt was made to group papers by subject content, this was not always possible. Factors which interfered with such scheduling efforts included time limits imposed for individual sessions in relation to the number of papers dealing with a given subject as well as the necessity of avoiding conflicts with other commitments for those reporting studies.

The number at the bottom of the page in this collection of abstracts represents the number assigned to the study and is identical to the number appearing in the convention program. The time and date each paper will be presented are indicated in the lower left-hand corner of each page. The name and address of the author to whom inquiries for further information may be sent appear in the lower right-hand corner. An index of all authors is presented at the conclusion of this volume.

Helen Eckert
Abstracts Editor
University of California,
Berkeley, California

ACKNOWLEDGMENTS

The Program Chairman of the Research Section was extremely fortunate that many individuals gave unselfishly of their professional talents in the planning and conduct of the 1973 meetings. Considerable time and effort were expended in both the reviewing of studies submitted for presentation and the actual scheduling of papers. The willingness of a number of AAHPER members to preside at the meetings is also acknowledged. Special appreciation is extended to Robert E. Allen, Anne E. Atwater, David Auxter, Hugh W. Bonner, Barbara L. Drinkwater, B. Don Franks, Jerry Freischlag, Joseph J. Gruber, Bernard Gutin, Dorothy V. Harris, Owen J. Holyoak, Herberta Lundegren, Arlene Morris, Loren G. Myhre, John M. Pearson, John P. Raducha, Mary Ann Roberton, John A. Roberts, Erika Sander, Gary D. Sinclair, Waneen Wyrick, and M. Nadine Zimmerman.

CONTENTS

THE USE OF A PERCEPTUAL-MOTOR TEST AND A COGNITIVE ABILITY TEST TO CLASSIFY FIRST GRADE CHILDREN INTO READING GROUPS. Jerry R. Thomas and Brad S. Chissom; Georgia Southern College.

The purposes of this study were to: assess the relationship between two predictor measures, the Shape-O Ball Test* (perceptual-motor) and the Otis-Lennon Mental Ability Test, and two criteria, reading performance (reading group) and general academic ability (teacher rating); and attempt to classify subjects into reading groups using the predictor measures. Subjects were 48 first grade students reflecting the socioeconomic and racial make-up of the local community. Data were collected by using: the Shape-O Ball Test which measures shape discrimination, perceptual-motor match and fine eye-hand coordination; the Otis-Lennon MAT which is a non-verbal test of general mental ability; a complex teaching rating including reading, numerical, verbal and listening ability; and the reading group to which subjects were currently assigned. Results indicated that: (1) the perceptual-motor test was significantly correlated with the Otis-Lennon Test ($r = .71$), the complex teacher rating ($r = .71$), and the reading group ($r = .64$); (2) using canonical correlation, the two predictors, Shape-O Ball Test and Otis-Lennon MAT, were significantly related ($R_c = .841$) to the two criteria, reading group and complex teacher rating; and (3) the Shape-O Ball Test and the Otis-Lennon MAT could be used in a discriminant analysis to successfully assign the subjects to reading groups. It appears that these two objective tests are useful for placing children into the proper reading groups.

*Directions for this test available from authors.

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April 13, 1973
9:00 a.m.

BASIC COMPONENTS IN THE MOTOR PERFORMANCE OF CHILDREN SIX TO NINE YEARS OF AGE. G. Lawrence Rarick, University of California, Berkeley.

The purpose of this investigation was to determine the factor structure of motor abilities of children in the age range six to nine years. Some 60 fine and gross motor tests were administered to 140 healthy boys and girls in attendance in an elementary school in the San Francisco Bay Area. The selection of the tests was based upon an hypothesized factor structure formulated from present knowledge of the motor abilities in man. Forty-seven of the 60 tests proved to be sufficiently reliable for inclusion in the final analysis. Intercorrelations among the test scores were calculated separately by sex and the inter-correlation matrices were factored by the method of principal components. Rotated factor loadings were obtained by Kaiser's Varimax analytic solution. The results of the factor analysis disclosed a well defined factor structure for both the boys and the girls. In the case of the boys eight factors were extracted accounting for 77.6 percent of the total variance. In the case of the girls the ten extracted factors accounted for 76 percent of the common variance. The single factor accounting for the greatest percentage of the variance in each sex was identified as a strength-power-body size factor. Other factors that were extracted in both sexes, identified by their respective factor loadings, were fine visual-motor coordination, speed and coordination of gross body movements, dead weight or body fat, balance, spinal flexibility in the antero-posterior plane, spinal flexibility in the lateral plane, and thigh-trunk strength.

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April 13, 1973
9:15 a.m.

THE CONSTRUCTION OF A MOTOR FITNESS TEST BATTERY FOR BOYS IN THE PRIMARY GRADES. James M. DiNucci, Northwestern State University and Roger Shore, Northwestern Junior High School.

In order to construct a scientifically designed evaluative instrument to assess the motor fitness of boys in the primary grades, 30 test items purported to measure muscular strength, muscular endurance, cardiovascular endurance, power, speed, agility, flexibility, and balance were administered to an incidental sample of 238 boys ages 6 to 9 years. An intercorrelational matrix was constructed for the factor analysis of the data using the principal axes method. Seven factors having eigenvalues above 1.000 and accounting for 65.17 percent of the variance were isolated. The first of two test batteries developed included the test items which loaded highest on each factor and were as follows: Clarke's strength composite; McCloy's endurance ratio; Well's sit and reach; Bass balance on a stick - lengthwise; wrist flexion and extension flexibility; arm flexion on the back flexibility; and modified push-ups. The second test battery, developed for more administrative feasibility, included items which loaded high on each factor and eliminated composite scores and ratios. The items in test battery II were: grip strength; 300 yard run; Well's sit and reach; Bass balance on a stick - lengthwise; wrist flexion and extension flexibility; arm flexion on the back flexibility; and modified push-ups.

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April 13, 1973
9:30 a.m.

THE FINE MOTOR PERFORMANCE OF CHILDREN AGED FIVE, SEVEN AND NINE YEARS, AND THE RELATIONSHIP OF THIS PERFORMANCE WITH SKELETAL AGE. Robert Kerr, Memorial University of Newfoundland.

The primary purpose of this study was to investigate the relationship between the performance of a fine motor task, by children of 5yr, 7yr and 8yr of age, and physical maturity as measured by skeletal age. The fine motor task was a reciprocal tapping task, performed by tapping with a dart between pairs of targets drawn on paper. The task being varied along the two perimeters of target width (W) and movement amplitude (A): where W = 3/8", 3/4", 1½", and A = 2½", 5" 10". A second purpose was to analyse the performance of the fine motor task and its relation to the age and sex of the subjects. Sixty Caucasian boys and girls attending private day care centers and elementary schools in the Eugene-Springfield, Oregon, area served as subjects. The three age groups selected were 5yr-7yr-9yr, and each age level included ten boys and ten girls. All subjects were tested within one month of their birthday to obtain some homogeneity in relation to chronological age. The data were collected during the winter and spring quarters of the 1971-72 academic year, and all the testing was done at the day care center or school the child attended. Radiographs of the left wrist and hand were taken for use in the skeletal age assessments. Correlations relating skeletal age to the fine motor task, using both regression coefficients and mean movement times to represent the performance of the fine motor task, indicated no consistent relationship between these variables. A three-way analysis of variance performed on the movement times yeilded significant F-ratio's, at the .001 level of confidence, for age differences and for differences between tasks. However, the differences between the sexes were not significant. Further analysis indicated that there was no significant difference between the slopes of the regression lines representing the motor performance of the three age groups. However, the differences in the intercepts for these regression lines were significant at the .01 level of confidence. Thus it would appear that the improvement in movement time with age relates more to a reduction in the time spent on the targets rather than on increase in the speed of the actual movement between the targets: i.e. an improved ability to plan a second movement whilst still performing the first.

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April 13, 1973
9:45 a.m.

OBSERVATIONAL LEARNING OF THROWING BY YOUNG BOYS UNDER CONDITIONS OF ACTUAL AND SYMBOLIC PRESENTATION OF A MODEL. Barbara J. Mead, Ph.D., Purdue University, Major Professor: Marguerite A. Clifton.

This study investigated the effects of incidental and intentional imitation upon young boys' learning of throwing responses under conditions of actual (live) and symbolic (videotape) presentation of a model. The imitation factor, incidental and intentional, was for the purpose of approximating both the social learning and motor learning settings in order to test the logic of applying information derived from the former to the latter. Three mechanical characteristics of the overarm throw were selected as the dependent variables to be studied: stride, spinal and pelvic rotation, and arm action. Rating scales to assess degree of imitation of the model were developed for each of the three, and judges applied the scales to the filmed performances of the subjects in order to derive imitation scores. Subjects for this experiment, 36 three- and four-year-old boys, were randomly assigned to one of the four treatment groups or to the control group. The model selected for the study was a sixteen-year-old male capable of consistent execution of the stride, rotation, and arm movements. Subjects in the experimental conditions were exposed to the model in each of two bouts; each bout consisted of six throws by the model followed by the subject performing six throws in the absence of the model. In the incidental condition the subject was led to perceive the model as another subject, while in the intentional condition he was told to watch and to copy the model. Control subjects had no exposure to the model, but were tested in the same manner as the experimental subjects. Multivariate analyses of variance were employed in order to consider the three dependent variables simultaneously in deriving conclusions regarding differences among groups in degree of learning. Both the imitation and media factors were significant, with the incidental groups scoring higher than either the intentional or control groups, and the TV groups scoring higher than the live or control groups. Within the limitations of this study, it was concluded that: the degree of learning of throwing responses is a function of the type of imitative setting and the mode of presentation of the model, but not of the number of bouts. The superiority of the incidental imitation condition suggests that physical educators can look to the research on observational learning done by social psychologists for guidance in structuring the teaching-learning environment and for a basis in continuing the inquiry as it applies to the development of efficient movement behavior.

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April 13, 1973
10:00 a.m.

PERSONALITY AND GRIP STRENGTH RELATIONSHIPS BETWEEN MONOZYGOUS AND DIZYGOUS TWINS. A. Craig Fisher, Ithaca College; Richard E. Stafford, State University of New York at Oneonta: Charles J. Ansorge, University of Nebraska.

The purposes of the study were twofold: to investigate the relationship between grip strength and the measures of age, height, weight, and the personality traits revealed by the Comrey Personality and Attitude Factor Scales; and to assess the influence of heredity on height, weight, and grip strength. Fifty-eight pairs of twins (MZ=30, DZ=28) served as Ss. Pearson product-moment correlations between grip strength and the factors of age, height, and weight revealed that weight appeared to be the best predictor of grip strength. When age was partialed out by standard score transformation, weight was no longer the best predictor. It was concluded that age was the best predictor of strength for both males and females. The hypothesis that personality might be related to performance in a grip strength testing situation received very little support. Personality did not appear to be an important function of the grip strength score. Within-twin pair variance of the DZ twins consistently exceeded that of the MZ twins on the factors of height, weight, and grip strength. Significant heritability coefficients were found for the factors of height, weight, and grip strength although not all coefficients reached statistical significance for both sexes.

A. Craig Fisher
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April 13, 1973
10:15 a.m.

DURATION AND FREQUENCY OF TRAINING AS DETERMINANTS OF CORONARY TREE CAPACITY IN THE RAT. Robert W. Haslam, University of Maryland; G. Alan Stull, University of Kentucky.

This study investigated the effects of selected frequencies and durations of training of young, male, albino rats on (1) the capacity of the coronary arterial tree and (2) the coronary cast weight to body weight ratio. Seventy Wistar rats were randomly assigned to a control and four experimental groups. The control group remained sedentary for eight weeks, and each of the experimental groups engaged in one of the possible combinations of training two or four times weekly over either four or eight weeks. Training consisted of swimming a number of one-minute trials with a thirty-second rest interval interposed between successive trails. Intensity of training was progressively raised by each week increasing the number of repetitions by four bouts. Rats were weighed weekly, and these body weights were used to calculate the resistance which each subject carried while swimming. The resistance represented 5 percent of body weight for animals swimming during the initial four weeks and 4 percent for those swimming during the terminal four weeks of the study. Following the eight-week experimental period, all animals were weighed and their coronary arteries injected with vinyl-acetate. This chemical hardened forming a rigid cast of the coronary arteries. The casts were subsequently weighed on a Metlar electrobalance scale, and these weights were used as measures of the volumetric capacity of the coronary arterial tree. The cast weight to body weight ratio was generated by dividing the coronary cast weight by the body weight of the rat. A two-factor (frequency x duration) analysis of variance in comparison with a control group design was utilized in the data analysis. It was found that when the combined effects of the experimental groups were compared with the values for the control group, both the coronary cast weights and cast weight to body weight ratios were higher for the experimental groups ($p < .05$). No additional significant effects were located.

G. Alan Stull
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April 13, 1973
9:00 a.m.

ADAPTATION OF SELECTED CARDIO-RESPIRATORY PARAMETERS MONITORED CONTINUOUSLY THROUGHOUT AN EIGHT WEEK TREADMILL TRAINING PROGRAM.

Arend Bonen, Gregory C. Gass, Vivian H. Heyward, Department of Physical Education, Physical Fitness Research Laboratory, University of Illinois at Urbana-Champaign, Champaign, Illinois

A number of investigators have reported the effects of train - ing on oxygen uptake and other cardio-respiratory parameters based on pre- and post-training observations. Another picture of adaptation can be obtained, however, by monitoring the parameters of interest on a continual basis throughout training. The purpose of this investigation was to examine, in three well conditioned young men, the changes in submaximal cardio-respiratory parameters during an 8 week training period of treadmill running. Training sessions were conducted on alternate days, three days per week. Each session consisted of a 5 minute warm-up walk at 3.7 mph, followed by a 30 minute run at 6.3 mph ($\simeq$65% $\dot{V}O_2$ max) and a 5 minute recovery walk at 3.7 mph. The treadmill was maintained at zero % grade. Throughout the 40 minute exercise period $\dot{V}_E$ and breathing rate were continuously recorded. Expired air was sampled over each 5 minute period and heart rate was recorded during the last 15 seconds of each 5 minute period. Throughout the training period, the oxygen cost (L/min) and the respiratory rate remained unchanged. It was observed that the $\dot{V}_E$, heart rate and RQ decreased progressively for a given 5 minute period of the run throughout the 8 weeks of training. The same parameters were decreased throughout the 30 minute run when the first week of training was compared to subsequent weeks. These patterns indicated that cardiac adaptation to exercise was progressively enhanced and there was a small shift toward fat metabolism. Comparisons of maximum $\dot{V}O_2$, $\dot{V}_E$ and heart rate before and after training revealed that the maximum $\dot{V}O_2$ was increased but no changes were observed in the maximum $\dot{V}_E$ and heart rate.

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April 13, 1973
9:15 a.m.

RETENTION OF VOLITIONAL CONTROL OF HEART RATE DURING EXERCISE STRESS. Victoria A. LeFevers, University of Iowa; Linda C. Zerkle, Eastern Illinois University.

The purpose of this investigation was to study the effects of a six-month period of no practice upon voluntary lowering of the heart rate during exercise stress between the three initial groups--13 Ss in Experimental Group I who received instrumental conditioning with visual feedback, 9 Ss in Experimental Group II who received instrumental conditioning with no visual feedback, and 7 Ss in the Control Group who received no conditioning. It was hypothesized that there were no significant differences between retention of the ability to lower heart rate voluntarily during exercise stress upon the treadmill between the three groups. The retention testing was identical to the original testing under exercise stress--one trial at each of four levels of exercise stress (assigned randomly and measured by heart rate)--100-120 bpm, 120-140 bpm, 140-160 bpm, and 160-180 bpm, while performing upon the treadmill. Analysis of variance and Duncan's New Multiple Range Test revealed that 1) there were no significant differences in retention between experimental groups at any of the four levels of stress; 2) there were significant differences in retention between EGI and CG at levels 100-120 bpm, 120-140 bpm, and 140-160 bpm; and 3) there were significant differences in retention between EGII and CG at levels 100-120 bpm, 120-140 bpm, and 140-160 bpm. It was concluded that type of feedback during initial conditioning period had little bearing upon retention of ability to lower the heart rate during exercise stress, but conditioning did facilitate retention of the skill.

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April 13, 1973
9:30 a.m.

CARDIAC ACCELERATION AND DECELERATION RESPONSE TO MANIPULATED TREADMILL EXERCISE. Richard B. Parr, Central Michigan University

The purpose of this study was to measure changes in cardiac acceleration rates to a predetermined training heart rate and cardiac deceleration rates following exercise. Sixteen male college students were used in the study. Training consisted of running on a Young Treadmill with an elevation of 4% and speed sufficient to elicit heart rates of 140 BPM, 160 BPM, or 180 BPM. Each day the speed of the treadmill was started at 3 m.p.h. and progressively increased until the training heart rate was reached. Training involved 10 min./day, 5 days/wk., for 6 weeks. The intensity of work was regulated by a Quinton QI 607 Automatic Heart Rate Control. Group Tr 140 showed minimal improvements in cardiac acceleration rates. Group Tr 160 showed the greatest improvements in cardiac acceleration rate during the second and third weeks of training. Group Tr 180 showed the greatest improvements in cardiac acceleration during the last three weeks of training as well as the greatest overall improvements. Group Tr 140 demonstrated inconsistent cardiac deceleration when compared to other training groups. Group Tr 160 and group Tr 180 showed greatest cardiac deceleration rates with group Tr 180 having the fastest recovery rate of the three training groups.

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April 13, 1973
9:45 a.m.

STRENGTH RECOVERY FOLLOWING RHYTHMIC OR SUSTAINED EXERCISE AS A FUNCTION OF TIME. Jay T. Kearney, Appalachian State University.

The relative rates of strength recovery subsequent to bouts of rhythmic or sustained isometric exercise were investigated. The research involved implementation of methodological adaptations designed to provide a more realistic comparison of the relative rates of strength recovery. The results were consequently used to assist in resolution of the contradictions inherent in earlier studies. The 72 undergraduates who voluntarily served as subjects were tested 7 times within the framework of a repeated measures design. Each testing session involved two bouts of either rhythmic or sustained isometric exercise separated by a rest interval of 5, 10, 20, 40, 80, 160, or 320 seconds. Strength recovery was evaluated by comparing the level of strength expressed at the conclusion of the initial fatigue bouts, final strength, and the initial strength measure of the second exercise bouts. The analysis of variance and related statistics indicated that: (1) significant strength decrements of similar magnitude were produced by both types of activity; (2) the group of subjects who initially performed rhythmic exercise were consistently stronger than those performing sustained exercise; (3) strength at the end of the first exercise bout was significantly lower than final recovery strength; and (4) initial strength and final recovery strength failed to differ significantly. The exponential analysis revealed that the patterns of strength recovery were both described adequately by two-component equations. The magnitude and rate constants of these curves were also reasonably comparable. Although not in complete accord with previously published results it was concluded that on the basis of the present investigation the patterns of strength recovery subsequent to rhythmic and sustained isometric exercise were similar.

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April 13, 1973
10:00 a.m.

INTERACTION OF FREQUENCY AND INTENSITY OF TRAINING ON PHYSICAL WORK CAPACITY. Thaddeus R. Crews, Northern Virginia Community College.

The purpose of this study was to determine the effect, if any, of the interaction of frequency and intensity of training (walking and/or jogging) on the physical work capacity, cardiovascular function and body composition of adult males. Forty-six sedentary male subjects were pretested on the following variables: physical work capacity, exercise and recovery heart rates, oxygen consumption, oxygen debt, respiratory quotient, ventilation equivalent and per cent body fat. Participants were randomly assigned to one of six training groups after an initial blocking on pretest physical work capacity scores. The subjects trained for seven weeks as members of the six groups representing all possible combinations of three levels of frequency of training (five, three or one day per week), and two levels of intensity of training (exercise heart rates of 150 and 120 beats per minute). All participants exercised 50 minutes each week, and thus the duration of a training session for each individual was dependent on the frequency of training. It was not required that the walking and/or jogging be performed continuously, but only that the subject train at the desired intensity level for the appropriate number of minutes. The jogging pace was progressively increased to maintain the desired intensity level as the condition of the subjects improved. Exercise heart rates during the training sessions were estimated by palpation during a 10-second interval immediately following exercise. At the end of the training program, the subjects were posttested in a manner identical to that of the pretest. The results of the statistical analyses revealed no significant interaction effect for any of the dependent variables. Examination of the main effects disclosed significant F ratios for intensity of training for the dependent variables physical work capacity, recovery heart rates at one, three and five minutes following a standard treadmill test and per cent body fat. Inspection of the pretest and posttest means for these variables indicated a greater training effect for the 150 intensity level. The only significant F value for the main effect, frequency of training, was found for physical work capacity. Through the use of a multiple comparison test, it was shown that both the five and three-day-a-week groups had significantly greater improvement than the one-day-a-week group. There was no significant difference between the five and three-day groups.

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April 13, 1973
10:15 a.m.

THE SEQUENCE OF HIP AND SELECTED UPPER-EXTREMITY JOINT MOVEMENTS DURING THE GOLF DRIVE. Charles L. Hunter, State University College, Potsdam

The purpose of the study was to analyze wrist, elbow, and hip actions of golfers while accurately driving a golf ball a maximum distance. Electrogoniometry and cinematography were used to measure wrist, forearm, elbow, and hip actions during the downswings of 10 low-handicap golfers while attempting to drive a minimum of 225 yards within a 50 yard corridor. Elgons were used to measure movements of the elbow (flexion-extension), forearm (pronation-supination), wrist (adduction-abduction, flexion-extension) at selected angles of the arm relative to a vertical line passing through the shoulder. Lateral and horizontal hip movements were recorded with a specially constructed analyzer. Motion pictures (64 frames/second) were taken in order to measure shoulder joint positions. Electrogoniograms were analyzed at selected positions: top of backswing; left arm horizontal, 45^{o} from vertical, 22.5^{o} from vertical, at vertical, and at ball contact. Analysis of mean values for joint positions revealed: (1) Active adduction of both wrists and right-wrist flexion just before ball contact, (2) Constant rate of lateral and rotational hip movement throughout the downswing, (3) The left elbow more fully extended than the right and near full extension at contact, (4) Considerable variation in forearm rotation, (5) Left-wrist flexion-extension positioning which was similar among golfers at ball contact, (6) The long axis of the left arm slightly beyond the vertical position at contact, and (7) No consistency among golfers relative to the position assumed while addressing the ball. It was concluded that there was no common pattern of action among the low-handicapped golfers, but that there were certain common characteristics relative to the timing and sequence of specific actions (e.g., wrist adduction and flexion just before ball contact).

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April 13, 1973
10:30 a.m.

EFFECTS OF RATE OF MOVEMENT ON EFFECTIVE MAXIMAL FORCE GENERATED BY ELBOW EXTENSORS.[1] Wynn F. Updyke, University of Florida; Victor Brenneman, University of Toledo; William Taggart, Northern Michigan University.

Forty male volunteers, aged 18-21, were tested for full range maximal isotonic strength of elbow flexors on a constant speed electrically powered dynamometer. Subjects were placed in the supine position and secured to a plinth with the left arm attached to the dynamometer lever arm, the fulcrum of which was aligned with the axis of elbow rotation. Clockwise and counter-clockwise rotation of the lever arm corresponded to elbow extension and flexion respectively. Subjects were tested in two modes ("concentric" and "eccentric" contraction) at each of three different velocities (.10, .20, and .33 radians/sec.). In the concentric mode subjects attempted to accelerate the lever arm by maximal sustained dynamic contraction of elbow extensors. In the eccentric mode subjects vigorously resisted elbow flexion forced upon them by the powered movement of the dynamometer. (Special electronic servo mechanisms were provided to avoid rate fluctuations due to back EMF.) It was hypothesized that forces observed would have an inverse relationship to speed of muscle shortening (or lengthening). The hypothesis was rejected (ANOVA, $P < .05$). Analysis revealed remarkably similar force curves at all three speeds, in terms of peak forces generated as well as slopes of the curves preceeding and following peak forces. As expected, mean peak forces occurred at approximately the same point in the curves regardless of mode or speed. Eccentric forces generated were consistently higher than concentric forces. It was concluded that subtle adaptations in the musculoskeletal linkages resulted in relatively constant force output regardless of variations in rate of muscle shortening.

1. This study was supported in part by a grant from the Research Council of the Graduate School of the University of Toledo.

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April 13, 1973
10:45 a.m.

FUNCTIONAL PROFILES OF SEVEN-FOOT AND SUB-SEVEN-FOOT HIGH JUMPERS. David A. Kaufmann, University of Florida

The purpose of this study was to determine if there were differences between seven-foot and sub-seven-foot high jumpers in the relative lean body weight, hip joint flexibility, oxygen consumption, upper limb reaction time and response time, lower limb response time, running agility, jumping power, running speed and torque about the hip and knee joints. Two seven-foot high jumpers and two sub-seven-foot high jumpers were measured in the above parameters. It was found in this study that 1) the sub-seven-foot high jumpers were superior in flexibility of the hip joint and upper limb response time 2) both groups of high jumpers were similar in oxygen consumption, upper limb reaction time, forward step and backward step response times, running agility, running speed, torque (straight kicking leg) in flexion about the hip joint and torque (kicking leg) in extension about the knee joint and 3) the seven-foot high jumpers were superior in relative amount of lean body weight, jumping power, torque (bent kicking leg) in flexion about the hip joint, torque (bent jumping leg) in extension about the hip joint and torque (jumping leg) in extension about the knee joint.

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April 13, 1973
11:00 a.m.

A CINEMATOGRAPHIC ANALYSIS OF CHARACTERISTIC LIKENESSES AND DIFFERENCES BETWEEN SKILLED, SEMI-SKILLED, AND NON-SKILLED PERFORMANCE OF PIROUETTES. MargeAnn Hume McMillan, Texas Woman's University.

A cinematographic analysis was conducted on performances of pirouettes en dehors by 9 women representing 3 different skill levels. A 16 mm. Bell and Howell HR 70 camera with a lens setting of f:1.6 was used in the filming. Tracings of 19 frames of film depicting the sagittal and frontal views of each subject were analyzed with respect to the preparation, turn, and conclusion of the pirouette. Point-and-line drawings of the movements of the ankle of the supporting leg and the ear or nose were constructed from the same selected frames of both views of the pirouette and used to analyze the movement of the supporting leg and to determine the periods of greatest utilization of floor space. The investigator concluded that cinematography can be used to identify similarities and differences between skill levels, to determine the extent to which skill performances adhere to characteristics of "good form" as stated in the literature and by experts, and to provide new information which will contribute to a more complete understanding of the movement patterns used in the execution of a skill.

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April 13, 1973
11:15 a.m.

THE EFFECTS OF STARTING BLOCK LENGTH, ANGLE, AND POSITION UPON SPRINT PERFORMANCE. Harold H. Morris, Northern Illinois University

This investigation considered the effects of variations in starting block position, front starting block length, and front starting block angle upon movement times from the starting position and upon running time. The three starting block variables, starting block position at four levels, front starting block length at two levels, and front starting block angle at three levels were arranged in a 4 x 2 x 3 factoral with repeated measures on one variable. Forty randomly selected male undergraduate students were randomly assigned to one of eight treatment groups. Each group practiced and was timed from a treatment condition that specified a single starting block position and a single front starting block length. All subjects, however, practiced and were timed from each of the three front starting block angles. Initial movement time of the hands, starting time of each foot, and running time across each of four equal segments of the 50-yard dash were recorded and analyzed as the criterion measures. Each criterion measure was subjected to an analysis of variance. Sprint performance was not affected by variations in starting block position. Initial movement time and starting time of the rear foot were affected by the angle of the front starting block. Front starting block angles and front starting block lengths interacted to cause differentiating effects upon the starting time of the front foot and upon acceleration during the initial segments of the dash. The advantage gained during acceleration due to the favorable effects of specific starting block conditions was present at the end of the dash. Initial movement time and the starting times of the feet are inadequate as measures of the effects of starting variables upon sprint performance. Runners accelerate to a point between 25 and 37 1/2 yards from the starting line.

Harold H. Morris
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April 13, 1973
11:30 a.m.

THE RELATIONSHIPS AMONG LEG STRENGTH, LEG POWER AND ALPINE SKIING SUCCESS. Larry R. Gettman, Ph.D., University of Denver; Jack R. Huckel, University of Denver.

The purpose of this study was to relate leg strength and power to alpine skiing success as measured by FIS points. Isometric leg strength was represented by the knee extension test described by Clarke. Leg power was measured by the vertical jump test and the Margaria-Kalamen stair run. Results in the strength and power tests were correlated with the FIS points in three different alpine events (downhill, slalom, and giant slalom). Subjects consisted of 26 female and 28 male participants in a national junior alpine development camp during June, 1972. These individuals were the best junior alpine ski racers in the U.S. for the 1971-72 season. The total number of both male and female skiers having FIS points in the downhill, slalom, and giant slalom events was 24, 40, and 42, respectively. Considering the entire group, a significant correlation coefficient was observed between FIS points in the giant slalom event and total leg strength. For females, significant correlations were found between success in the giant slalom and leg strength, stair power, and vertical jump work. For males, significant relationships were seen between vertical jump work and FIS points in the downhill and giant slalom events. In conclusion, for female junior alpine skiers, leg strength and power measurements were only related to success in the giant slalom event. For male junior skiers, only the leg power measurement of vertical jump work was related to the downhill and giant slalom events.

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April 13, 1973
11:45 a.m.

A STUDY OF FACTORS RELATED TO SPEED OF RUNNING AND REACTION TIME AMONG BLACK, MEXICAN-AMERICAN, AND WHITE FEMALES ELEVEN YEARS OF AGE IN THE PERFORMANCE OF THE 50-YARD DASH. Mary A. Ramirez, Texas Woman's University.

A comparative study was conducted to measure reaction time and speed of running between various segments of the 50-yd. dash; specifically, 15 yd., 30 yd., 50 yd., starting time, acceleration speed, and maximum sprint velocity. Subjects selected for the study were 100 black, 55 Mexican-American, and 45 white. Data were collected by electric eye rods, electric timers, and a modified starting pad. Data were subjected to statistical treatment of ANOVA. No significant differences in wt., ht., and reaction time among the black, Mexican-American, and white groups were noted. Significant differences ($p < .01$) were obtained between the groups in favor of the black children on speed of running 15 yds., speed at 30 yds., and speed at 50 yds. Similar significant differences were noted in comparisons of time derived from various segments of the race: starting time, 15 yds. minus reaction time; acceleration time, 30 yds. minus 15 yds.; and maximum sprint velocity, 50 yds. minus 30 yds. All differences among these items were found to be highly significant at the .01 level in favor of the black subjects with the exception of maximum sprint velocity, which was significant at the .05 level. No significant differences were discovered between the white and Mexican-American children. The investigator concluded that black children have significantly faster times in running the 50-yd. dash and faster comparable segments than white or Mexican-American children of similar age, grade level, wt., and ht. Since no significant differences were found between the groups in reaction time, it would seem that speed as measured in this study does not appear to be closely related to reaction time.

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April 13, 1973

3:15 p.m.

The Relationship Of Attitudes And Locus Of Control To Physical Fitness And To Frequency Of Exercise. Robert J. Sonstroem and Maxwell I. Walker, University of Rhode Island.

The purpose of this research was to examine the relationship of locus of control to maintenance of physical fitness. Attitudes regarding the instrumentality of physical activity were employed to specify direction for the locus of control construct. A random sample of 102 college upper-classmen was obtained from the middle quartiles of a distribution of 600-yard run scores recorded when subjects were freshmen. Subjects were recruited with a letter signed by the Director of University Health Services inviting them to participate in a study assessing student living habits. Subjects were paid $5 and represented 83.1% of those people receiving the letter. At the University Health Center a physical examination, Kenyon's ATPA test, Rotter's I-E Scale, and a study-developed inventory assessing voluntary participation in physical exercise were administered to subjects. On a subsequent day they again performed the 600-yard run. Four groups of subjects were formed by dichotomizing attitude and control scores. Internal controllers with positive attitudes regarding physical activity performed significantly better (.01 level) at the 600-yard run than the other three groups as tested by analysis of covariance and planned comparisons. They reported significantly greater involvement (.01 level) in recreational physical activity as tested by analysis of variance and planned comparisons. A further analysis of the data indicated that within three of the attitude score quartiles, internal controllers performed more favorably on dependent variables than did external controllers. First quartile results were interpreted as supporting previous locus of control research which concludes that externals devalue the reinforcement value of a task after failing to achieve at that task, while internals are more prone to take action for personal improvement.

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April 13, 1973
3:30 p.m.

MUSCULAR STRENGTH, SOCIAL ADJUSTMENT, AND PERSONALITY TRAITS IN FIVE SOCIO-ECONOMIC GROUPS. Charles W. Jackson, Old Dominion University.

The purpose of this study was to investigate the differences in strength, social adjustment, and personality traits of boys in the various socio-economic brackets at the junior and senior high school levels. The Two Factor Index of Social Position was obtained for each boy in grades seven, nine and eleven of selected schools in Norfolk and Virginia Beach, Virginia. From this population, a sample of approximately 100 boys for each of the five socio-economic groups was selected by the use of a table of random numbers. Data relative to muscular strength (Strength Quotient using Cable-tension strength tests), personality (Junior-Senior High School Personality Questionnaire), and social adjustment (Cowell Personal Distance Ballot) was collected by the investigator. The data collected were treated statistically by using the treatments x levels analysis of variance technique. The results of the various analyses revealed the following findings: 1. 7th and 9th grade upper socio-economic groups scored significantly higher on the Strength Index than any of the other boys studied. Also, when age and weight were considered in computing the Strength Quotient, the 11th grade boys did not score as high as the 7th and 9th grade boys. In addition, all of the mean Strength Index scores obtained were well below the established medians for the respective groups. It appears that if boys in the low socio-economic bracket valued strength, they did not reflect these values on performance tests of strength. 2. The comparison of the social adjustment scores of the boys indicated that there were no significant differences between the socio-economic groups. 3. The comparisons of the 14 HSPQ personality scores of the boys indicated that only a few of the qualities measured reflected significant differences between the various groupings established.

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April 13, 1973
3:45 p.m.

SOCIAL FACILITATION EFFECTS ON CHILDREN DURING EARLY STAGES OF MOTOR LEARNING. James M. Crabbe, The University of Iowa.

Zajonc has implied that drive, as evidenced in social facilitation research, is innate. In contrast, Cottrell has hypothesized that this drive is a result of social learning. Zajonc implied that the trend of early learning scores on a difficult task would be lower for a subject who learned in the presence of an Audience than for a subject who learned Alone. Cottrell has implied that a young person, not socially conditioned to anticipate positive and negative outcomes from an Audience, would perform similarly in the presence of an Audience or Alone. The purpose of this study was to investigate the Zajonc-Cottrell theoretical conflict pertaining to drive by testing children during early learning on a gross motor task, and within the Audience effect paradigm of social facilitation. Two hundred and forty youngsters served as subjects. They were selected randomly of both sexes and equally from a large preschool and a public school second-grade. Each subject completed 10 trials on the stabilometer task under an "Alone" or an "Audience" learning condition. Average and trend learning scores were computed for each subject. Three multi-dimensional analysis of variance designs were used in the analysis. The .05 level of significance was chosen to designate the region of rejection of the null hypothesis. Second-grade subjects attained a higher level of performance than did preschool subjects. The analysis for rate of learning revealed an interaction between Audience conditions and Age levels. Preschool subjects learned in the Alone condition at a higher rate than when in the presence of an Audience. However, second-grade subjects learned at a higher rate in the presence of an Audience than in the Alone condition. Within the limitations of this study, it was concluded that the motor response tendencies of children are most probably influenced by their prior social experiences. This conclusion tended to support the Cottrell hypothesis that performance, in the audience effect paradigm of social facilitation, is dependent upon the child's social history.

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April 13, 1973
4:00 p.m.

PSYCHOLOGICAL EFFECTS OF DISTANCE TRAINING ON EIGHT TO TWELVE YEAR OLD CHILDREN. Kenneth G. Burnsed, University of Florida.

Serving as subjects in the study were 45 volunteers from a previous summer's age group track program and 29 students in a fifth grade class at a local elementary school. The subjects were divided into three groups for observation. Group I (N=17) underwent an eight-week distance training program. Group II (N=28) served as a training control group, undergoing an eight-week program during which the basic fundamentals and techniques involved in the various field and sprinting events of track and field were taught. Groups I and II met at different times for one hour sessions, five days a week. Group III served as a pure control group and consisted of students in the fifth grade class at a local elementary school. R. B. Cattell's fourteen factor Children's Personality Questionnaire, Form A, was administered to all three groups immediately prior to and following the eight-week program. An analysis of covariance with the pre test serving as the covariant was performed on each of the fourteen factors of the Children's Personality Questionnaire with the aid of an IBM Series 365-60 computer at the University of Florida. The variables considered in the analysis of covariance were sex, group, and sex by group interaction. Groups I and II scored significantly higher (α =.05) than Group III on Factor B, less intelligent vs. more intelligent, following completion of the program. Also, females scored significantly higher (α =.05) than males on Factor D, phlegmatic vs. excitable. No other statistically significant differences were obtained.

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April 13, 1973
4:15 p.m.

EFFECTS OF CONTINUOUS AND INTERMITTENT WORK ON HEAT ACCLIMATION OF WOMEN. Judith T. Fein, Department of Physical Education for Women, University of Iowa, Iowa City, Iowa 52240*

The purpose of this study was to determine the effects of continuous and intermittent work on acclimating young women to a hot dry environment. Nine physically active young, equated on the basis of maximal oxygen uptake per kilogram of body weight, performed either continuous or intermittent work on a treadmill for 100 minutes daily for eight days under conditions of 49/46±1°C db/wb. The continuous group walked on a level treadmill at a rate which resulted in a work load which was equal to 34±4% of their maximal oxygen uptake. The intermittent group worked and rested for five minute intervals. Walking speed was 3.5 mph and the treadmill was elevated to a grade which resulted in an average oxygen consumption of 34±4% of maximal. Physiological measurements included: mean skin temperatures, rectal temperatures, heart rates, sweat rates, and energy metabolism. Graphic and subjective techniques were employed to analyze the data. Criteria used for the development of acclimation were lowered work rectal temperatures, mean skin temperatures and heart rates; increased sweat production; ability to complete assigned tasks and subjective comfort. Individuals in the intermittent group became acclimated to the heat, while in the continuous group, two subjects became acclimated and two partially acclimated.

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April 13, 1973
4:30 p.m.

ASSESSMENT OF THE AEROBIC CAPACITY OF YOUNG ACTIVE FEMALE AMERICAN PHYSICAL EDUCATION MAJORS. L. Dennis Humphrey and Harold B. Falls, Southwest Missouri State University.

The purpose of the study was to determine the maximum aerobic capacity of a large group of young active American female physical education majors. Fifteen subjects utilized a progressive bicycle ergometer test, and 36 subjects utilized a motor driven treadmill to complete the Balke Progressive Test. Heart rates were recorded each minute by utilizing a bipolar EKG connected to a physiograph recorder. Expired air was collected in Douglas bags, and the final two minutes of the progressive exercise were analyzed for concentrations of CO_2 and O_2 by utilizing a Godart analyzer calibrated against a micro-Scholander and a Gallenkamp-Lloyd apparatus. Gas volumes were determined by evacuating the air through a dry gas meter. Each subject was tested twice and the results averaged. Means for both groups were as follows:

Means	Bicycle	Treadmill
$\dot{V}O_2$ liters/min. STPD	1.97	2.23
$\dot{V}O_2$ ml/min./kg STPD	34.35	39.80
$\dot{V}O_2$ liter/min. BTPS	78.26	90.53
Max. Heart Rate	184.6	191.7
Exercise Duration	14.7	16.6
R.Q.		1.03

For the treadmill group the determined $\dot{V}O_2$ was nearly identical to the value reported for female physical education majors in 1942, similar to basketball players in Massachusetts, and greater than values reported for nonathletes and nonphysical education majors in this country. However, when compared to female Swedish physical education students, Norwegian athletes, Czechoslovakian swimmers, and American speed skaters, the treadmill group's $\dot{V}O_2$ was considerably less. For the bicycle group the determined $\dot{V}O_2$ was approximately 13% less than the treadmill group, considerably greater than values reported for California nonathletes, similar to other nonathletes and basketball participants in New York. However, the bicycle group was less than the values reported for other physical education students and considerably less than the values reported for Swedish, Norwegian, Czechoslovakian, and American athletes.

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April 13, 1973
4:45 p.m.

THE EFFECT OF SPECIFIC EXERCISES ON SUBCUTANEOUS FAT AND SEGMENTAL VOLUME OF THE ABDOMINAL REGION IN COLLEGE WOMEN.
Mignon Jutton, University of Missouri-St. Louis and James H. Johnson, Washington University, St. Louis, Missouri.

The purpose of the study was to compare the effectiveness of a system of specific abdominal exercises with generalized exercise on the reduction of segmental volume and subcutaneous fat of the abdominal region in college women. The study was conducted during the first six weeks of the 1972 Spring semester, with volunteer female subjects enrolled in Gymnastics, Volleyball, Swimming and Ice Skating at Washington University, St. Louis, Missouri. Subjects were tested initially for subcutaneous fat taking three skinfold measures at the abdominal region. Subjects were divided at random into control and experimental groups and both groups participated in an activity class for six weeks. In addition, the experimental group performed a set of specific abdominal exercises three times weekly for the six weeks. The exercises were basket hang, hook lying sit-up, side-lying trunk raise, and controlled backward lean. Subjects gaining or losing three percent or more body weight were eliminated from the study. The remaining twenty-six subjects were tested following the training period and the mean change between initial and final measurements was analyzed for both groups on each of the variables, using a t-test for correlated means. An analysis of corvariance was used to determine any significant differences between the groups on each post-test. Pearson's product moment method was employed to determine the relationship between skinfold measures and abdominal volume. Specific abdominal exercise is significantly more effective in reducing segmental abdominal volume than generalized exercise when body weight remains unchanged in college women during a six week, 3 days/week, exercise program. Adipose tissue in the abdominal region, however, is not significantly reduced by either specific or generalized exercise when body weight remains unchanged in college women. There is a low positive relationship between abdominal volume and adipose tissue (r=0.336).

Mignon Jutton
University of Missouri-St. Louis
St. Louis, Missouri 63121

April 13, 1973
5:00 p.m.

A COMPARISON OF WEIGHT REDUCTION METHODS THAT USE DIET AND EXERCISE. W. B. Zuti, Kansas State University; Lawrence A. Golding, Kent State University.

The purpose of this study was to compare the amount of weight loss that occurred with the use of three different methods of weight reduction. The 25 adult women used as subjects in this study were between 25-45 years of age and approximately 20-40 lbs. overweight. This study was designed to create a caloric deficit that would cause a reduction in body weight of 1-lb/week for 16 weeks, for all groups. The three experimental groups used diet, exercise and a combination of diet and exercise as the means of weight reduction. The group using the all diet method consisted of eight subjects who reduced their caloric intake by 500 Cal/day and held their physical activity constant. The all exercise group of nine women increased their physical activity by 500 Cal/day and maintained their caloric intake at a constant level. The eight women in the combination group reduced their intake by 250 Cal/day and increased their physical activity by 250 Cal/day. The subjects were weighed in the post absorbative state before and after the 16-week experimental period to determine changes in total body weight. During the experimental treatment the subjects were controlled in their daily caloric intake and in their daily physical activity. A two-way ANOVA repeated on one measure was used to analyze the data. The results indicated the methods used to create a 500 Cal/day deficit were only partially effective, since only 71.1% of the projected 16 lbs. weight loss was attained. The results of the two-way ANOVA indicated the method used to create a caloric deficit had no significant effect on the amount of weight lost. The average loss of the diet group was 11.7 lbs., for the combination group it was 12.0 lbs. and for the all exercise group it was 10.6 lbs. The method of determining caloric expenditure may have created some error when estimating the amount of weight the subjects would lose. The data indicated that since there was no statistical difference in weight loss among the groups, that the method in which a caloric deficit is created is not important.

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April 13, 1973
5:15 p.m.

MAXIMAL OXYGEN INTAKE AND MAXIMAL WORK PERFORMANCE OF ACTIVE COLLEGE WOMEN. Susanne L. Higgs, University of Saskatchewan, Regina Campus.

The purpose of this study was to measure an individual's capacity to work for a period of time at the intensity of exercise which had elicited her maximal oxygen intake. A sub-problem of the study was to investigate the relationship between maximal oxygen intake and work time at the level of work which elicited maximal oxygen intake. Twenty women physical education majors served as subjects. The treadmill technique described by Taylor et al., which consisted of a varying number of discreet runs, was essentially utilized for the assessment of maximal oxygen intake. Following the measurement of maximal oxygen intake, each subject underwent an all-out endurance performance test on the treadmill at the work level which had elicited her maximal oxygen intake. The findings were as follows. Mean maximal oxygen intake was 41.32 ml./kg./min. and mean maximal heart rate was 185.8 bts./min. In the endurance performance test the mean run time for all subjects was 4:35.8 minutes. Correlation between maximal oxygen intake and performance time was calculated and found to be insignificant ($r = .066$); however, a highly signficant correlation was obtained between maximal oxygen intake and physical work done during the performance test ($r = .64$).

Susanne L. Higgs
Physical Education Department
University of Sask., Regina Campus
Regina, Saskatchewan

April 13, 1973
5:30 p.m.

EFFECTS OF ENDURANCE JOGGING PROGRAM ON
CARDIOVASCULAR SYSTEM AND BODY COMPOSITION
IN MIDDLE AGED-WOMEN

Ali Tooshi
Jersey City State College

Purpose: The purpose of this study is to investigate the effects of 30 mins endurance jogging on pulse rates at rest, during exercise and at recovery and eight skinfold fat measures in middle-aged women.

Method: The subjects in this study were 15 middle-aged women between 30 and 58 years of age who have not been engaged in any exercise program at least for one year. Eight sedentary subjects were used as control group. The program was continues progressive jogging. The intensity of work out was set at 14 mins per mile at the beginning of the program and it was increased to 8 mins at end of tenth week of the program.

The subjects exercised 30 minutes a day, five days a week for total of 16 weeks.

A six minutes submaximal exercise test was administrated to all subjects using Monarch bicycle ergometer. The procedures followed in administration of test was similar to Astrand. The pulse rates recording were made on the Exercise Cardio Tachometer. The fasting body weight and eight skinfold fat measures were obtained from all the subjects, using Lange Skinfold fat Caliper.

For the treatment of the data, t test was employed and five per cent level of significant was accepted.

Results:

1. A significant reduction was occured in resting, exercise and recovery pulse rates.
2. A significant reduction was made in skinfold fat measures
3. No significant reduction was noticed in body weight.

Ali Tooshi
Jersey City State College
Jersey City, New Jersey

April 13, 1973
5:45 p.m.

THE THROWING PATTERNS OF THE MENTALLY RETARDED. DAVID AUXTER, SLIPPERY ROCK STATE COLLEGE.

The purpose of this study was to explore the developmental sequences which lead to the acquisition of throwing skills among the Mentally Retarded. The subjects in this study were 110 educable mentally retarded children between the ages of 7 and 12 years with an I.Q. from 50 to 75. A spring operated movie camera set at 64 frames per/sec was used to collect data for the purposes of studying developmental throwing patterns in the mentally retarded. The developmental patterns were assessed in accord with the spatial temporal integration of the body parts in the throw as compared to conceptual models of appropriately integrated throwing patterns. The analysis of the data was concerned in observing the following elements of the throw 1) amount of body rotation, 2) length of the step forward, 3) temporal transfer of weight in relationship to the release, 4) integration of the joint actions required to throw the projectile, 5) the angle of the release of the projectile, 6) spatial temporal integration of the component parts of the throw. The 110 throwing behaviors were classified into 16 distinct patterns which indicated progression in spatial-temporal integration of more body parts. Thus a developmental scale was constructed of patterns of throwing progression. Such a scale enables the measurement and subsequent prescription of activities for the purpose of engaging children in progressively more elaborate throwing patterns and integrated neuromuscular movements for throwing purposes.

David Auxter
Department of Physical Education
Slippery Rock State College
Slippery Rock, Pennsylvania 16057

April 13, 1973
4:30 p.m.

THE RELATIONSHIP BETWEEN PHYSICAL FITNESS AND INTELLIGENCE IN TRAINABLE MENTAL RETARDATES. James E. Liese, J. F. Kennedy School Harold A. Lerch, University of Florida.

The purpose of this study was to determine if any relationship exists between intelligence and physical fitness in high school age trainable mentally retarded males. Each subject was administered the Stanford Binet Intelligence Test (Form L-M), the A.A.H.P.E.R. Youth Fitness Test and the Fleishman Basic Fitness Tests. A correlation matrix was devised and the coefficients were checked for significance. The findings tend to support the notion that fitness and intelligence are significantly related.

James E. Liese, Ph.D.
J. F. Kennedy School
Modesto, California

April 13, 1973
4:45 p.m.

THE EFFECT OF TWO LEVELS OF PRE-TASK EXERCISE UPON THE PERFORMANCE OF A GROSS MOTOR TASK BY EDUCABLE MENTALLY RETARDED CHILDREN. Jan C. Stoner, The University of Texas at Austin.

Specifically, the exercise bout consisted of riding a bicycle ergometer at one-half maximum effort (Group 1) and at one-fourth maximum effort (Group 2) for two minutes at a rate of one revolution per second. Immediately following the exercise bout each subject performed ten trials of twenty seconds duration on the stabilometer with twenty second intertrial rest periods. The control group (Group 3) had the same learning task but was not involved in a pre-task exercise bout. Ninety subjects, between the ages of twelve and eighteen years, were randomly assigned to one of the three groups. On the second day of testing (Day 2) all subjects returned to the test room in a non-exercised condition. Each performed five stabilometer trials of twenty seconds duration with a twenty-second intertrial rest period. Analysis of the scores obtained from the first day revealed non-significant differences between groups. Analysis of the second day's scores also revealed non-significant differences among the groups. The performance scores for trials one through fifteen, however, showed a significant difference for all groups. These scores showed a linear learning curve with significant improvement between the initial and final performance trial. Based on this evidence it was concluded that the exercising activities on the first day of trials did not significantly effect learning.

Jan C. Stoner
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The University of Texas at Austin
Austin, Texas 78712

April 13, 1973
5:00 p.m.

RELIABILITY ESTIMATES OF GRIP STRENGTH ASSESSMENT IN THE INSTITUTIONALIZED MENTALLY RETARDED. Colleen George, North Texas State University.

Forty-eight right-handed students at the Denton State School were given grip strength tests with a Jamar dynamometer to determine the effect of the tonic neck posture upon preferred and nonpreferred grip. Three different reliability estimates illustrated the fallacy of using the simple product moment r as the measure of reliability. The institutionalized mentally retarded subjects in the study exhibited a wide range of ability as well as significant trial-to-trial variation in strength measures. The data were appropriate for application of an alternate reliability estimate as well as rationale for choice of a criterion measure as expressed in recent research reports of isometric strength. Possible reasons for variability in the institutionalized retarded subjects' strength scores were discussed. Suggestions were made for an alternate measurement schedule designated to reduce error variability in the institutionalized mentally retarded subjects in the study.

Colleen George
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April 13, 1973
5:15 p.m.

STABILOMETER PERFORMANCE AS A FUNCTION OF LEG STRENGTH BY MENTALLY RETARDED AND NONRETARDED ADOLESCENT MALES. William C. Chasey, Peabody College.

The purpose of this study was to investigate the relationship between leg strength and stabilometer performance by 15 institutionalized trainable mentally retarded (TMR), 15 institutionalized educable mentally retarded (EMR), 15 noninstitutionalized EMR, and 15 nonretarded adolescent males. Each S was measured for leg strength, leg girth and calf girth prior to performance on a standing broad jump and stabilometer tests. The mean of three trials on the standing broad jump test and the mean of 10 trials on the stabilometer, each trial of 30 seconds duration with a 15 second rest period between trials, were used for analysis. It was hypothesized that: (a) nonretarded Ss would perform better than retarded Ss; (b) EMR Ss would perform better than TMR Ss; (c) noninstitutionalized EMR Ss would perform better than institutionalized EMR Ss; (d) leg strength would be related to stabilometer performance for all groups on both tasks, and leg length, thigh girth and calf girth would be related to performance on the standing broad jump and stabilometer for all groups. Analysis indicated that hypotheses 1, 2 and 3 were tenable. There was a progressive significant difference in stabilometer performance and intelligence levels. EMR Ss performed significantly better than TMR Ss. Noninstitutionalized EMR Ss performed better than institutionalized Ss, Stabilometer and broad jump performances correlated for all groups except the TMR Ss (.05). There was no significant difference between the three anthropometric measures and performances on the two motor tasks.

William C. Chasey
Kennedy Center for Research
George Peabody College
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April 13, 1973
5:30 p.m.

DISTRIBUTION OF PRACTICE AS A FACTOR IN MENTAL RETARDATES ACQUISITON OF A MOTOR SKILL. Stanley L. Bassin and Michael Webster, California State Polytechnic University, Pomona.

The purpose of this study was to determine which type of practice schedule would enhance mental retardates motor performance and learning. Thirty male mentally retardate subjects were matched as closely as possible according to I.Q., C.A., and M.A. Their scores ranged from 36 to 67 mean 52, 6.0 to 14.0 mean 9.0, 13 to 22 mean 18.0, respectively. The instrument used to measure learning was a modified Lafayette Pursuit Rotor with a 3/4 inch round target which rotated in a circle with a 10 inch diameter. The target rotated clockwise at 33 rpm. Each subject performed 20 pre-rest trials on either a schedule of 20 seconds work and no rest, or 20 seconds work and 20 seconds rest. After a 5 minute interpolated rest, all subjects performed for 7 additional trials on a 20 second work/10 second rest schedule. The results indicated that the distributed group performance was significantly better than the mass group, when initial trial and final pre-rest trial scores were calculated. There was no significant difference found in learning between the 2 groups when initial pre-rest trial and first post-rest trial scores were compared. The mass practice group demonstrated a significantly different reminiscence score from the distributed practice group, between the final pre-rest trial and inital post-rest trial. The adjacent trial reliabilities ranged from .68 to .88 for the mass practice group, and .87 to .94 for the distributed practice group. In view of the results, it appears that mental retardates follow similar learning and performance profiles, as normal subjects, reported in the literature.

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April 13, 1973
5:45 p.m.

PATTERNS OF ERROR IN KINESTHETIC PERCEPTION*. Waneen Wyrick, The University of Texas at Austin.

Individuals' kinesthetic perception was investigated to detect patterns of subjective reduction, augmentation, or moderation of stimuli. Absolute errors and variable errors were determined for 34 college men on three tests of kinesthesis: joint angle reproduction (JAR), muscular tension reproduction (MTR), and limb load discrimination (LD). Measurements were obtained by electrogoniometry, electromyography, and the Difference Limen technique. Data were normally distributed and the constant error neared zero; consequently absolute and variable errors were highly correlated (.86). Under these conditions variable error and constant error were measuring the same thing, therefore only variable error was used in consequent analyses. Variable errors in kinesthetic perception among the three tests were not significantly correlated, with r coefficients ranging from .03-.19. A multiple discriminant analysis revealed that when the subjects were post-data collection categorized into augmenters, reducers, or moderators of the basis of JAR, they were not also differentiated as such in the other two tests of kinesthetic perception. One significant univariate F ratio supported the hypothesis that moderators in weight discrimination also tended to be moderators of JAR. When the proprioceptive tests were considered multivariately, however, no pattern emerged. On the basis of these results, Petrie's model of augmentation and reduction of stimuli must be questioned and perhaps supplanted by a model of proprioceptive specificity.

*This investigation was supported by PHS Research Grant NS09854-01 from National Institute of Neurological Diseases and Blindness.

Waneen Wyrick
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April 14, 1973
9:00 a.m.

THE EFFECT OF STIMULUS CONDITION AND DIRECTION ON THE REACTION TIME AND MOVEMENT TIME OF SELECTED ATHLETIC GROUPS. Thomas R. Burke, Hunter College

This study was conducted to investigate the effects of stimulus condition and direction on the reaction time (RT) and the movement time (MT) of closed and open skill athletes. The stimulus conditions were simple and complex. In the simple stimulus condition, the athlete knew in advance of response initiation the direction of movement but did not know when to initiate the response until stimulus activation. Under the complex stimulus condition, the athlete did not know in advance of response initiation either when or what directional response to initiate until stimulus activation. The directions of movement were to the front, to the right, to the left and to the rear of the athlete. The closed skill athletes (CSAs) were cross-country runners, swimmers and gymnasts; and the open skill athletes (OSAs) were basketball, baseball and soccer players. Each athlete performed a total body movement in each of the four directions under simple and complex stimulus conditions. Measures of RT and MT were recorded for each athlete. An analysis of variance was used to analyze the RT and MT measures. Significant differences in RT measures were observed between: 1) the simple and complex stimulus conditions, 2) the open and closed skill athletes, and 3) the four directions with the RT measures to the back the slowest, faster in the right direction, even faster in the left direction with the fastest RT measure to the front. Significant differences in MT measures were observed between: 1) the simple and complex stimulus conditions, 2) the open and closed skill athletes, and 3) the four directions, with the MT measures slowest to the back, faster to the front, even faster to the right direction, with the fastest MT measures in the left direction. A significant interaction was achieved between the stimulus condition and the direction.

Thomas R. Burke
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April 14, 1973
9:15 a.m.

EFFECTS OF MOVEMENT COMPLEXITY ON REACTION AND MOVEMENT TIMES IN CHOICE REACTION TASKS. Mary Lou Norrie, University of California at Berkeley.

The effects of movement complexity on one, two, and four choice reaction times were investigated. In addition, the effect of choice reaction situations on movement time was investigated. Two groups of 24 college age men volunteers from activity classes performed a choice reaction time task. One group performed using a simple 3 1/2 in. movement from the reaction button to the appropriate response button. The other group performed using a complex movement in which they first moved forward 11 in. to slap a button and then returned to the appropriate response button. Both groups performed 20 trials under each choice condition (one, two, and four choices). Standard Electric SL timers were used to record reaction and movement times. To avoid confounding the results with changes resulting from practice only the last ten trials were used in analyzing the data. For the simple movement group reaction time increased significantly as the number of choices increased from one to two to four. For the complex movement group reaction time in multiple choice situations was significantly longer than for the simple one choice situation. However, the reaction time did not increase significantly as the number of choices increased from two to four. As the number of choices increased the effects of movement complexity on reaction time lessened in that significant differences were found for the one and two choice situations but not for the four choice situation. For the simple movement group there was some indication of significantly longer movement times in the multiple choice situation. For the complex movement group movement times were significantly longer for the multiple choice situations than the one choice situation. However, movement time did not increase significantly as the number of choices increased from two to four. The results indicated that most of the slow down occurred in the first part of the movement, although there was some evidence of trading off between the two parts of the complex movement.

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April 14, 1973
9:30 a.m.

Novel Skill Learning and Gross Motor Performance Correlates

The purpose of this research was to determine the relative importance of various basic motor ability traits possessed by the learner in the process of acquiring neuromuscular skills. Fifty-two university students practiced two novel skills (ball toss and fli-back paddle ball) five days per week for two weeks. Motor performance scores on twenty-six reference variables were assessed prior to beginning practice. Factor analysis was employed to isolate basic factors underlying each practice sequence and the gross motor performance traits. Ten stable factors were isolated: two describing practice on each of the two novel skills and eight identified as involving gross motor performance. Comparisons of the factor loadings among practice stages for each novel skill across the eight motor performance factors suggested the following conclusions: (1) no relationship existed between gross motor factors and performance on the fli-back paddle ball skill, (2) gross motor factors were related to performance on the ball toss skill during early, but not late, stages of practice, (3) different gross motor factors related to performance on the ball toss skill aa practice continued, (4) practice became the major factor explaining variation in performance for the ball toss skill as practice continued, and (5) performance on the ball toss skill should be assessed only after several practice periods to prevent previous experience from contaminating the skill assessment.

This study was supported in part by a faculty research grant at Stephen F. Austin State University, Nacogdoches, Texas.

Charles O. Dotson
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College Park, Maryland 20742

April 14, 1973
9:45 a.m.

THE MOTOR PERFORMANCE AND MOTOR LEARNING RATES IN THE NON-DOMINANT HAND OF CHILDREN AS A FUNCTION OF LATERALITY, AGE AND SEX. M. Kathryn Scott, University of California, Berkeley.

Sixty-four subjects were used to investigate the effects of laterality, age and sex on motor performance and motor learning of the non-dominant hand. For the pursuit rotor task, the target moved at a speed of 33 RPM, whereas the ball rolling task required that the subject roll a duck pin bowling ball on a strip of foam rubber aiming at a target line 18 feet away from the subject. The subjects were tested for lateral dominance by a 15 item laterality performance test. The results showed that the performance on the pursuit rotor with the left hand by right dominant subjects was, on the average, significantly better than the performance of the left dominant subjects with the right hand. With the ball task there was no significant difference in mean performance as a function of laterality. There were significant differences in mean performance on both tasks as a function of age and sex. In the learning scores, there were no significant differences between the mean scores at the start and the end of the two learning tasks indicated that learning, regardless of laterality, had occurred with each task for each sex at each age level.

M. Kathryn Scott
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April 14, 1973
10:00 a.m.

SPECIFICITY OF COINCIDENCE-ANTICIPATION. Paul Dunham, Jr., Earlham College and Harold L. Glad, Washington University, St. Louis.

The purpose of this study was two-fold: (1) to investigate the relationship between subjects' coincidence-anticipation performance employing four different appendages, and (2) to determine if there was a significant difference between the subjects' performances on the various appendages. Fifty undergraduates volunteered to serve as subjects for this experiment. Subjects were given 16 coincidence-anticipation trials, four each using his preferred hand, preferred foot, non-preferred hand and non-preferred foot. The apparatus was a 15 foot, 8 inch trough through which a small car traveled unobservable to subjects. Suspended from the bottom of the car and extending down was a 12-inch steel rod with a 2-3/4 inch styrofoam ball attached to the distal end. Subjects were required to release a spring switch the instant the ball coincided with a small metal flag. Subjects' score was determined as the difference between actual time and estimated time as recorded on .01 second LaFayette timers. Results indicated that subjects' performance using the four different limbs were virtually unrelated in agreement with the theory of task specificity. Analysis of variance: two-way classification for subjects tested under different conditions revealed no significant difference between performance of various limbs, $F = .711$ but indicated a significant difference between individuals' performances, $F = 2.163$.

Paul Dunham, Jr.
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April 14, 1973
10:15 a.m.

SUPERSTITIONS OF CANADIAN ATHLETES: AN INTER-SPORT COMPARISON.

C. Jane Gregory and Brian M. Petrie, University of Western Ontario

Belief structures categorized as superstitions were investigated among members of six selected Intercollegiate athletic teams enrolled at the University of Western Ontario during the 1971-72 academic year. A mailed questionnaire was employed as the survey instrument and distributed to 174 athletes chosen by systematic random sampling from lists supplied by the Department of Athletics. The overall return rate was 73.26 per cent (team sport athletes 78.26%: individual sports athletes 68.42%). Using the Spearman Rank Correlation Coefficient to determine differences between rankings of superstitions in sub-groups, it was found that; (a) the rankings of general superstitions were substantially similar among team and individual sport athletes, (b) although the correlations on lists of general superstitions by sex and sport were statistically significant, there was greater similarity in the rankings of the female athletes, (c) the rankings for sport superstitions were similar between team and individual sport athletes, (d) there was a greater similarity in the rankings of sport superstitions among males. Team sport athletes provided greater support for superstitions related to equipment and its use, to order of entering arena or playing position, to dressing room activities, to repetitive rituals, and to sports personalities. Individual sport athletes gave higher support for superstition related to the wearing of charms, to lucky lane numbers, to team cheers, and to crossing oneself before participation. Sport superstitions were identified with particular activities, for example, (a) Hockey - equipment and order and player position, (b) Basketball - the sinking of the last warm-up shot, (c) Volleyball - travel superstitions, (d) Swimming - colour of suit, (e) Track - clothing, sox, lane no., and superstitions related to shoes, (f) Tennis - weather and lucky balls (by brand). The recourse to superstitious beliefs and practices as determinants of success or effective participation was found to be particularly prevalent among the athletes of the sample. The fact that 137 respondents endorsed 904 superstitions (with repetition) which could be grouped into 40 categories clearly indicated the strength of superstition in sport.

C.Jane Gregory
University of Western Ontario
London, Canada

April 14, 1973
10:30 a.m.

POLITICAL ATTITUDES OF ATHLETES AND NONATHLETES IN A CANADIAN UNIVERSITY SETTING. Brian M. Petrie, University of Western Ontario.

A variety of reports, both conjectural and scientific, as well as current beliefs of the youth counterculture, have identified university athletes as being more politically conservative than nonathletes. Such reports indicate little more than the attachment of a form of "global conservatism" to the athletes. The present study evaluated the political attitudes of students of the University of Western Ontario on several dimensions, (a) "global conservatism-liberalism" as measured by the McClosky Scale, (b) self-report assessment of one's own political ideology, (c) the Rehberg Scale of Political Activism, and (d) Likert scales measuring attitudes toward specific social and political issues related to political ideologies. A mailed questionnaire was employed as a research tool and distributed to, (a) 224 students selected by systematic random sampling from a list of male and female Intercollegiate athletes participating in the 1971-72 academic year, and (b) 227 nonathletes selected by the same technique from a list of male and female students registered for the same academic year. The overall return rate for the questionnaire was 64.96 per cent (athletes 66.96%: nonathletes 62.99%). Data were analyzed to determine prevailing political ideologies and differences between groups on athletic participation, academic programme, and sex. The results indicated that, regardless of measure employed or variable introduced, the athletes and nonathletes were predominantly liberal in their ideologies. These results applied to "global liberalism" as well as "issue-oriented liberalism". The results were interpreted to indicate, (a) rejection of the U.S. - data-based theoretical propositions regarding political beliefs of Canadian athletes, or, (b) intrusion of methodological problems such as a social desirability response set. The need for replication of the study was emphasized, particularly in the U.S., where more concern has been expressed regarding political ideologies of athletes in comparison with nonathletes in the university setting.

Brian M. Petrie
University of Western Ontario
London, Canada

April 14, 1973
10:45 a.m.

THE ATHLETE's DILEMMA: AN EXPERIMENTAL GAME USING A PRISONER'S DILEMMA PAYOFF MATRIX ADAPTED TO A PADDLEBALL TOURNAMENT, Theodore William Harmon Johnson, Ed.D., State University College at Brockport.

The "Athlete's Dilemma," (AD) is a two-person decision-making game involving two choices: 1) the choice of playing, or 2) the choice of not playing the third game of a paddleball match. If both players choose to play the third game, they both do better in tournament scoring than if both choose not to play, but the maximum payoff for each individual can be obtained only by choosing not to play the third game while the other person chooses to play. The AD was designed to serve as a research tool for observing cooperative and competitive behavior. The problem was to investigate the cooperative and competitive behaviors of physical education majors (PE), non-majors (NM), and varsity football players (FB). Forty-eight male volunteer subjects enrolled in the University of New Mexico were used. Four groups of twelve subjects each played round robin schedules. The experimental group play was arranged in the following manner: 1) PE vs. PE, 2) NM vs. NM, 3) FB vs. FB, and 4) PE vs. NM. An overall difference in group means was significant at the .01 level. Differences between the combined experimental group (PE-NM) and the football players; and between the combined group and the physical education majors were significant at the .05 level. The hypotheses that varsity football players would be more competitive than physical education majors and non-majors, and that physical education majors would be more competitive than non-majors were not supported at the .05 confidence level. Conclusions. The results of this experiment lead to the following conclusions: 1) The AD game is a functional research tool for the empirical observation of cooperative and competitive behaviors; 2) the environment in which an experimental game is conducted has some effect upon the manner in which subjects play; and 3) more studies must be made before generalizations about the AD play of independent populations can be made.

Theodore William Harmon Johnson, EdD
Sport Science Department
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April 14, 1973
11:00 a.m.

FIELD DEPENDENCE-INDEPENDENCE AND ATHLETIC TEAM CHOICE.
David Pargman, Boston University; Lynn B. Schreiber, Boston University.

Fifty-one "team" sport and sixty-four "individual" sport players were tested with the Hidden Figures Test (cf-1). Scores on this test are indicative of the perceptual characteristic of field dependence-independence, which in turn refers to the perception one has of himself in relationship to his surrounding field. Six additional variables were also investigated in order to determine their relationship to athletic team choice (age; academic semester; number of varsity athletic seasons for specific sport; age at which subject first began organized competition in sport; grade point average and major field of study). "Individual" sport athletes scored significantly higher on the Hidden Figures Test than "team" sport athletes, thereby indicating greater field independence. Academic semester and starting age of specific sport participation were observed to be significantly different according to "team" or "individual" sport affiliation, as well as among sport groups. Grade point average was observed to be a significantly differentiating variable among athletic groups, but not between "team" and "individual" athletic groups. Significant differences were also observed among various "college major" groups of athletic subjects.

David Pargman
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April 14, 1973
11:15 a.m.

A COMPARISON OF ATHLETES AND NON-ATHLETES IN THE APPREHENSION OF 'GAME STRATEGY' IN A COMPETITIVE AND COOPERATIVE LEARNING ENVIRONMENT. Linus J. Dowell, Texas A&M University

The purpose of this study was to compare athletes and non-athletes in the apprehension of 'game strategy' in a competitive and cooperative learning environment. Five hundred and fifty-two male Ss were divided alphabetically into sets of eight. Cooperation sets sat around a table or in a circle in a separate room from the Competitive Group. Each S in both groups was handed a play booklet with the target correctly placed in 12 game matrices. Both groups were to deduce the rules necessary for correct placement of the target. Cooperative Groups developed rules as a team while Competitive Groups developed the rules individually. All Ss were given a sheet of paper and pencil with which to record rules as they developed them. The rules were used as a guide in determining correct placement of the target in game matrices appearing on the final test. After twenty minutes, play booklets were turned in and test booklets and answer sheets were distributed. At the top of each answer sheet an Information Check List contained a place for subjects to check Athlete if they had earned a high school athletic letter and a place to check Non-Athlete if they did not earn a high school athletic letter. Answer sheets were graded and recorded on IBM cards along with Information Check List data. Comparisons were made between athletes and non-athletes under competitive and cooperative learning conditions by the BIMED, two by two ANOVA computer program. Athletes and non-athletes learn 'Game Strategy' to the same degree in a competitive learning environment as they do in a cooperative learning environment. Athletes do not learn 'Game Strategy' more readily than non-athletes in a competitive or cooperative learning environment. Athletes, in general do not deduce 'Game Strategy' more accurately than non-athletes.

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April 14, 1973
11:30 a.m.

CANONICAL RELATIONSHIPS AMONG PSYCHOSOCIAL FACTORS AND SPORT PREFERENCE. Andrew Yiannakis, University of California at Los Angeles.

The purpose of this study was to investigate whether sport preference is a random phenomenon or, it is related to specific factors in the background and environment of the participant. In addition, to explore the feasibility of forming a framework for the systematic analysis of this phenomenon by interrelating findings from independent investigators. A questionnaire was administered to 411 male and female participants in a voluntary sports program at the University of New Mexico in the spring of 1972. Information was obtained on such variables as social class, ethnic background, birth order and body esteem, among others. The Ss also indicated their degree of preference for seven selected sports. The data were treated by means of canonical correlation, a multivariate procedure which handles a large array of variables in sets rather than individually. Four meanigful canonical correlations were obtained of which the first two were significant beyond the .01 level. The first canonical relationship of .730 indicates that being male and being most competent in body contact sports is associated with indicating a preference for football. Variables contributing to the second relationship of .467 indicate that being of a higher social class and stressing the pursuit of vertigo is associated with sky diving, soccer and skiing. It was concluded that preference for specific sports is contingent upon a number of background and environmental factors being present and possibly interacting. Furthermore, this study revealed that by showing how a number of variables interrelate in a manner which permits the linking of these results at a higher theoretical level, a framework can be generated which may aid the systematic analysis of this phenomenon at both practical and theoretical levels.

Andrew Yiannakis
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April 14, 1973
11:45 a.m.

FACTORS RELATED TO THE PERCEPTION OF WORK EFFORT. Ernest D. Michael Jr., University of California, Santa Barbara

Subjects were asked to exercise on a treadmill for 5 minutes at 6 mph, 0% grade. Following this standard work effort, the grade was changed to 5% and the subjects asked to adjust the speed to exactly equal the standard effort. The treadmill speed was then set at 3.5 mph and the subjects were asked to adjust the slope so the work effort would equal the standard work effort. There were 12 male and 9 female subjects. Since the responses were similar between the male and female subjects, the data were grouped and the results analyzed. Results showed that there were insignificant differences in work effort when the subjects were asked to adjust the slope of the treadmill and higher energy costs, ventilations, heart rates and R.Q. levels when subjects were asked to adjust the speed to equate the standard effort. The ability to perceive a work load related to the cues from the heart rate and ventilation measurements when the speed of the run was changed and the grade was adjusted, however, the adjustment of the speed at the 5% grade was such that the subjects underestimated the work that was being done. The heart rate and ventilation measurements therefore did not act as cues in the estimation of work effort when the exercise was modified through changing the grade of running. Evidently the cues to the perception of work effort are affected following a change in the grade of running. It is hypothesized that the perception of effort is dependent on circulatory-metabolic cues unless impulses from the muscles are affected by grade running.

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April 14, 1973
9:00 a.m.

EFFECT OF SELECTED WARM DOWN WORK LEVELS ON BLOOD LACTATE REMOVAL

Gregory L. Dykstra, Richard A. Boileau*, James E. Misner,
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The practice of warming down following strenuous exercise is widely accepted; however, the physiological benefits of active versus passive recovery remain controversial. The purpose of this study was to investigate the effectiveness of inactivity and several levels of recovery exercise in removing blood lactate following a strenuous but submaximal exercise stress. The rate of blood lactic acid removal at five different recovery workloads and the maximal oxygen consumption ($\dot{V}O_2$ max) were determined in three subjects on the bicycle ergometer. During each of the five duplicated recovery tests performed by each subject, an eight minute stress at approximately 90% $\dot{V}O_2$ max was followed by a twenty minute period in which the subject recovered at one of the following exercise levels: rest, 25%, 40%, 55% and 70% of the $\dot{V}O_2$ max. Blood samples were taken from a pre-warmed fingertip at five minute intervals during the recovery period. Additionally, oxygen intake and heart rate were determined periodically and the mechanical work performed was monitored continuously in both the initial 90% exercise stress and the selected recovery condition. The slope of the line relating the log of the five lactic acid concentrations to time for each of the five recovery workloads was compared to steady state heart rate, steady state $\dot{V}O_2$ and mechanical work done during recovery. The results obtained indicate that the disappearance of lactic acid was most rapid when the subject recovered within the following ranges: heart rates between 110 and 140, oxygen consumption at rates corresponding to between 25% and 47% of the $\dot{V}O_2$ max, and recovery workloads between 410 and 725 KPM/min. This study suggests that active recovery at a moderate exercise level, rather than passive recovery, most effectively reduces lactic acid in the blood, and therefore optimizes the warm down effect.

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April 14, 1973
9:15 a.m.

A STUDY OF THE RELATIONSHIP BETWEEN FIFTH AND SIXTH GRADE CHILDREN'S MAXIMAL OXYGEN INTAKE AND RUNNING PERFORMANCE AT SELECT DISTANCES. John M. Dunn, University of Connecticut.

The purpose of this study was to examine the relationship between fifth and sixth grade children's maximal oxygen intake and their running performance at distances of 600, 900, 1200, and 1500 yards. Additional sub-problems studied were: to establish a reliability coefficient for the distance run most related to maximal oxygen intake, and to analyze differences in running performance times and maximal oxygen intake by sex, grade and sex within grade. One hundred and ten children selected in equal numbers by grade and sex from four schools were included in the study. A parental permission form as well as successful completion of a pre-exercise physical examination were required of all subjects. All of the children were given a series of tests by the investigator and an assistant. The first test was a treadmill test in which the subjects ran for as long as possible so that their maximal oxygen intake could be determined. Three to four weeks later the children ran, for time, distances of 600, 900, 1200, and 1500 yards. Approximately two day intervals were permitted between running test. The order of the tests was randomly rotated so that possible training effects would not bias the results. The null hypothesis which stated that there is no relationship between the children's running performance and their maximal oxygen intake was tested by a multiple regression program. To analyze the first sub-problem, a reliability coefficient was determined for the run-walk distance most closely related to maximal oxygen intake. Forty-nine of the subjects at the last two schools tested were retested one week later at the 1500 yard run distance. Additional sub-problems investigating differences in run performance times and maximal oxygen intake by grade, sex, and sex within grade, were determined by an analysis of variance. The following conclusions were made: (a) The four running performance tests are equally, but not highly related to maximal oxygen intake; however, they are at present the best measures available for assessing the cardiovascular fitness of fifth and sixth grade children. (b) The 1500 yard run-walk is a reliable test. (c) The boys running times and maximal oxygen intake values were better than the girls; however, no real differences were found between grades.

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April 14, 1973
9:30 a.m.

THE EFFECTS OF SPECIFIC TRAINING UPON THE DIFFERENCE IN MAX $\dot{V}O_2$ SCORES BETWEEN TREADMILL AND BICYCLE ERGOMETER TESTS. Gary S. Pechar, Queens College.

The purpose of this study was to determine the extent to which training programs utilizing the bicycle ergometer or treadmill as the means of exercise would reduce the initial difference between max $\dot{V}O_2$ scores as measured by treadmill and bicycle ergometer tests. Sixty college-age males enrolled in elective physical education courses at Queens College volunteered as subjects. The subjects were randomly assigned into one of three training conditions: treadmill training, bicycle ergometer training or no-training (control). Subjects in the treadmill and bicycle ergometer training groups exercised 20 minutes per day, 3 days per week for 8 weeks at a work intensity which elicited a heart rate of 85% of each subject's maximum heart rate. Subjects in the control group did not participate in any training program. Max $\dot{V}O_2$ was measured before and immediately following the training conditions by means of a treadmill (Mitchell, Sproule and Chapman) and bicycle ergometer test (Astrand). The results showed that bicycle ergometer training produced a greater reduction in the mean difference between max $\dot{V}O_2$ scores as measured on the treadmill and bicycle ergometer when compared with treadmill training ($P < .05$) and no-training programs ($P < .01$). It was concluded that a training program utilizing the bicycle ergometer as the means of exercise significantly reduced the difference between max $\dot{V}O_2$ scores as measured by the treadmill and bicycle ergometer tests.

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April 14, 1973
9:45 a.m.

INSTRUMENTATIONS REQUIRED TO EXTEND THE OPERATING RANGE OF A PORTABLE RESPIROMETER. Joan M. Stevenson, University of Minnesota.

The purpose of this study was to investigate the necessary changes in a portable Respirometer to permit its usage under field conditions at maximal work levels. The equipment tested was a 10-lb. Max Planck Respiration Gasmeter; whose only specifications listed were volume accuracy ranges up to 60 litres per minute $\pm$ 1 l. Known volumes of 100-200 l. contained in a Tissot Tank were forced at one minute flow rate through the Respirometer, to test its accuracy in recording volumes. Known concentrations of oxygen were collected by way of the Respirometer in thermatically sealed plastic bags to test the accuracy of the collecting device used for the study. The testing condition used to evaluate the Respirometer at high work intensity was the Taylor three-minute Intermittent Treadmill Test with the Tissot Tank being used as a collecting device. The maximal oxygen consumption values of four female athletes was attained by this method. Then the Intermittent Treadmill Test was repeated at a maximal level using the Respirometer as a collecting device. In order to standardize the testing conditions as much as possible, the same headgear, mouthpiece and length and diameter of tubing was used with the Respirometer and with the Tissot Tank. Volume results showed that the Respirometer was consistent in its variation from 60 l., the stated specifications, up to 200 l. per minute. Gas analysis from the plastic bags of the Respirometer showed that even after a three to twelve hour delay the bags increased in oxygen concentration by only .053% due to the dead space and the transfer procedures, not leakage. In comparing the maximal oxygen consumption of the athletes from the Tissot Tank to the Respirometer, there was a decrease in mean value of 1.45cc/Kgm/min at a maximal level, which was caused by the slightly higher resistance with the internal mechanisms of the Respirometer. It would seem from these results that, if the Respirometer were constructed out of lighter materials and better headgear was designed, it could be converted into an instrument which could then record high sub-maximal and maximal levels of work during performance.

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April 14, 1973
10:00 a.m.

CHANGES IN $\dot{V}O_2$ MAX. RESULTING FROM BICYCLE TRAINING AT DIFFERENT INTENSITIES HOLDING TOTAL MECHANICAL WORK CONSTANT.

Edmund J. Burke, Jr. and B. Don Franks, Biokinetics Research Lab, Temple University.

Effects of different training intensities on $\dot{V}O_2$ max. were determined. Sixteen male Ss (ages 16 - 18) were randomly assigned to one of three training groups or a control group. The training groups trained three days/week on bicycle ergometers at different intensities (85%, 75% or 65% of max. HR) with all groups doing the same total mechanical work (2000 Watts per training session). ANCOV revealed significant differences ($P<.025$) between both 85% and 75% groups and the control group. No significant difference ($P>.05$) was found between the 65% group and the control group. Within the limitations of the study, it was concluded that when comparing between training intensities while holding mechanical work constant it is necessary to work at a minimum of 75% of max. HR to elicit significant changes in $\dot{V}O_2$ max.

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April 14, 1973
10:15 a.m.

OXYGEN DEFICIT - OXYGEN REPLACEMENT RELATIONSHIP IN RUNNING.

Donald F. McMiken, The University of Texas at Austin; Forrest A. Dolgener, The University of Texas at Austin.

It was the purpose of this study to determine the O_2 deficit - O_2 repayment relationship in running for various durations to accumulate more conclusive evidence concerning the effect of duration of work on the O_2 deficit - O_2 repayment relationship. Oxygen uptake was measured on six male college students during baseline work of walking on a treadmill at 60 m/min., while running at 160 m/min., and again while walking at the baseline level. The duration of running for each trial was randomly selected from six to 16 minutes at two-minute intervals. Several shorter trials between one and three minutes were also administered. During running, 60-second samples of expired gas were collected during durations up to and including three minutes, and two-minute samples were collected during durations greater than three minutes. During the recovery baseline work of 16 minutes, expired gas was continuously collected in three two-minute samples and two five-minute samples. Results indicated an O_2 deficit - O_2 repayment ratio of approximately 2.7:1 for the steady state trials. The O_2 deficit was correlated with $\dot{V}O_2$ during work ($r=.78$ $P<.05$). Multiple linear regression analysis revealed no significant relationships of other variables to O_2 repayment. Limitations of the study, mainly sample size, prevented any firm conclusions from being drawn.

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April 14, 1973
10:30 a.m.

OXYGEN CONSUMPTION IN THE FIRST STAGES OF STRENUOUS WORK AS A FUNCTION OF PRIOR EXERCISE. Bernard Gutin, Kerry Stewart, Steven Lewis, Jacqueline Kruper, Teachers College, Columbia University.

This study examined the extent to which 10 minutes of prior exercise (PE) at a workload adjusted to maintain a heart rate (HR) of 140 bpm could facilitate the mobilization of the O_2 transport system in a strenuous criterion task (CT). The interval between the PE and CT was 30 seconds. The CT required the S to pedal for 2 minutes at a load of 1632 kpm/min. The control treatment involved completion of the CT following 10 minutes of rest on the ergometer. Comparisons between treatments were made during the 30 seconds between PE and CT, for four 30 second periods during the CT and for the 60 seconds following the CT. VO_2 was significantly higher following PE at every stage except the second 30 second period of the CT and the 60 second post-CT period. Ventilation was significantly higher following PE at every stage except the last 30 seconds of the CT and the 60 second post-CT period. HR was significantly higher following PE at every stage. And O_2 pulse was significantly higher following PE only during the 30 second pre-CT period and the first 30 seconds of the CT, indicating that the PE facilitated the mobilization of stroke volume (SV) and/or A-V O_2 difference. The similar values for O_2 pulse during the last 90 seconds of the CT indicate that the higher VO_2 following PE was a function of higher HR, not higher SV or A-V O_2 difference.

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April 14, 1973
10:45 a.m.

Optimal Measurement Schedules for Submaximal Oxygen Consumption Tests When Heart Rate Is The Criterion Measurement. John C. Holland, University of Houston; Andrew S. Jackson, University of Houston.

Heart rate is currently being widely used as the criterion measurement in submaximal oxygen consumption experiments. For such a practice to be valid, it must first be reliable. Therefore, this study examined the reliability of heart rate during a standardized submaximal oxygen consumption test. More specifically the study attempted to examine the sources of measurement error associated with such a test and to recommend optimal measurement schedules. A random sample of thirty-five males and a second random sample of thirty-two females were selected from two pools of University of Houston physical education students. All subjects were administered two trials of a standardized submaximal oxygen consumption test (3 KP for males and 2 KP for females) on two different days. Approximately seven days elapsed between the day trials with each experiment lasting seven minutes. The heart rates for the final 15 seconds of each minute of work were considered trials. A two factor ANOVA design with repeated measures on both factors was used to search for systematic sources of variation. Trend analysis was used to establish when the criterion measurements of heart rate stabilized. Intraclass reliability procedures were used to estimate the reliability of the heart rates for the selected measurement schedules that included: multiple trials within days and multiple trials between days. This study was replicated by analyzing both the male and female samples with the statistical findings being identical for both samples. The ANOVA revealed that both the between days and days-by-trials interaction were not significant. The component of trials produced a significant curvilinear trend with heart rate stabilizing during the fourth, fifth and sixth minutes. The intraclass reliability estimates were high for both samples.

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April 14, 1973
11:00 a.m.

RELATIONSHIP BETWEEN INDIVIDUAL DIFFERENCES IN A STEADY PACE ENDURANCE RUNNING PERFORMANCE AND MAXIMAL OXYGEN INTAKE. Frank I. Katch, Gary S. Pechar, William D. McArdle, Arthur L. Weltman, Queens College.

The relationship between individual differences in a steady-pace endurance running test and maximal oxygen intake (l/min., ml/kg·min., ml/kg LBW·min) was determined in 25 college men. In the running test subjects attempted to maintain an initial running speed of 10 mph (4.89 yards/sec) for 10-minutes as they were paced around a 440 yd. track. Running performance was scored as running time between consecutive sections of the track, and an endurance score was calculated as the cumulated distance run during each minute. Max $\dot{V}O_2$ (ml/kg · min) correlated r = .61 with cumulative distance after 5 minutes of running. Validity correlations were only slightly increased by including minutes 8 to 10. Expressing Max $\dot{V}O_2$ in either l/min or ml/kg LBW·min did not improve the correlation. Percent drop-off in running speed from the initial pace averaged 16% at min 5 and 31% at min 10. Percent body fat correlated poorly with min-by-min performance (average r = .04), but was inversely correlated with 10 minutes of cumulative performance (r = -.48). At least 4-min of running was required to predict the 10-min cumulative performance criterion (r = .81; Sy·x = 13.2 yards); a 5-min run raised the correlation to r = .87 (Sy·x = 11.1 yards). Individual differences in min-by-min endurance performance were substantial throughout the run. These results suggest that a performance measure of running endurance, where all individuals begin running at 10 mph and attempt to maintain this speed for 10-min, should be continued for at least 5-min to achieve moderate validity.

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April 14, 1973
11:15 a.m.

PREDICTION OF MAXIMAL OXYGEN INTAKE FROM ASTRAND-RHYMING TEST, 12-MINUTE RUN, AND ANTHROPOMETRIC VARIABLES USING STEPWISE MULTIPLE REGRESSION. George T. Jessup, Homer Tolson, and James W. Terry, Texas A&M University.

When used with normally distributed groups of subjects simple regression techniques, such as the Astrand-Rhyming Test and 12-Minute Run which are based upon the rectilinear relationship of heart rate to VO_2 or the relationship between physical working capacity and maximal oxygen intake, seem to differentiate fairly well among varying levels of cardio-respiratory fitness. If, however, volunteer subjects are tested with these instruments, the predictive validity may tend to fall in relation to the homogeneity of the group. Since these tests probably measure different aspects of cardio-respiratory fitness, it seemed reasonable to utilize multiple regression analysis to improve upon the predictions of the simple regression models. It was the problem of this investigation to compare the prediction of maximal oxygen intake with simple and with multiple regression models in young volunteer subjects. The subjects were 40 volunteer male college students 18 to 23 years of age (mean 19.5), 65 to 74 inches in height (mean 69.9), and 122 to 185 pounds body weight (mean 154.8). Each subject performed the Balke Treadmill Test of physical working capacity, at the end of which one-minute air samples were collected and analyzed for V_E with a dry gas meter and for percent CO_2 and O_2 with a Micro-Scholander apparatus. The Astrand-Rhyming Test and 12-Minute Run were administered approximately one week apart. The data were analyzed with a computer program that performed a stepwise multiple linear regression (UCLA BIMED 02R). MAX VO_2 ranged from 2.86 to 5.17 l/min (mean 4.21). The simple regression model predicting MAX VO_2 from that predicted by the Astrand-Rhyming Nomogram yielded a correlation coefficient of $r = 0.13$, possibly indicating sample homogeneity. The best multiple prediction equation, MAX VO_2 = 5.493 + WEIGHT(0.028) + ASTRAND-RHYMING(0.019) - HEIGHT(0.249) + LEG LENGTH(0.176) + 12-MIN RUN(0.336) + AGE(0.009), yielded a coefficient of $R = 0.824$. Stepwise multiple regression analysis appears to improve the prediction of MAX VO_2 in homogeneous volunteer subjects.

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April 14, 1973
11:30 a.m.

THE METABOLIC BASIS OF EXCESS POST-EXERCISE OXYGEN CONSUMPTION (THE O_2 DEBT). George A. Brooks, University of California, Berkeley.

Traditional concepts regarding the mechanisms held to be responsible for elevated rates of O_2 consumption after exercise (the O_2 debt) have been investigated and found to be in error. These conclusions have been reached:

1) Glycogen synthesis is not a dominant process in the immediate post exercise period;
2) Most lactate is not resynthesized to glycogen, but rather is oxidized or converted to blood glucose;
3) Exercise induced hyperthermia is an undeniable factor contributing to the magnitude of excess post-exercise O_2 consumption;
4) The term O_2 debt is a misnomer and has been replaced with the descriptive term "excess post-exercise O_2 consumption." Further, with these realizations, it will be necessary to reassess definitions of gross and net body efficiencies.

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April 14, 1973
11:45 a.m.

WOMEN'S BASKETBALL: AN HISTORICAL REVIEW OF SELECTED ORGANIZATIONS WHICH INFLUENCED ITS ASCENSION TOWARD ADVANCED COMPETITION IN THE UNITED STATES. Margaret R. Downing, Texas Woman's University.

A critical examination was made of the origin, purpose, membership, meetings, finance procedures, and powers and obligations of selected athletic organizations in the United States which influenced the rise of women's basketball toward advanced competition. The method of historical research was employed in the preparation and presentation of this study; facts from primary sources were obtained by reviewing all available official records, proceedings, correspondence, and reports related to the activities of the selected organizations: the Women's National Basketball Committee of the AAU (WNBC), the USOC for Women's Basketball (USOCWB), the National Girls Basketball League (NGBL), the AAU-DGWS Joint Rules Committee, and the National Institute of Girls Sports (NIGS). Findings indicated that the ascension of women's basketball in the United States was influenced by the following: 1) The crisis years of World War II changed attitudes and social customs regarding women in the United States. 2) Increased participation at the international level introduced the aspect of political pressure which served as a catalyst among various athletic organizations to accelerate women's basketball programs. 3) The establishment of a DGWS-AAU Joint Rules Committee in the early 1960s enhanced cooperation between the two organizations and apparently increased opportunities for participation by women. 4) Prominent NGBLcoaches served as catalyst to prod the AAU and DGWS toward major rule changes which greatly influenced team preparation at the international level. 5) The selection of a DGWS oriented woman as chairman to the powerful AAU National Women's Basketball Committee in 1964 provided continued momentum toward increased cooperative efforts between the two organizations. It was concluded that the crisis of World War II served as the prime factor which created a two-fold change of attitudes toward the role of women in the American society: that of woman's attitude regarding her own capabilities; and the attitude of society in general toward woman's new position in all facets of life outside the home environment. As social attitudes and customs have become more equal, opportunities for women in the United States to compete at advanced levels in basketball have increased proportionately.

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April 14, 1973
4:00 p.m.

WOMEN AS EDUCATORS/THE EDUCATION OF WOMEN: EDUCATION FOR AND BY WOMEN IN THE LAST DECADES OF THE EIGHTEENTH CENTURY WITH PARTICULAR REFERENCE TO THEIR VIEWS ON PHYSICAL EDUCATION (AMAR Y BORBON; WOLLSTONECRAFT; CAMPAN; GENLIS). Roberta J. Park, University of California, Berkeley.

Works authored by women who lived before the latter decades of the nineteenth century seem to be seldom considered in histories of physical education. Yet, there have been many women in earlier periods of history who have spoken out forcefully in favor of physical education and whose ideas, at least at the time they were enunciated, attracted a sizeable, and often, favorable audience. One such period is the last decades of the eighteenth century. Stimulated by the progressive and humanistic ideas of the Enlightenment, women in several countries advocated a more liberalized education for all children and, especially, an improved education for girls. The views held by such women did much to encourage the progress in education for women which Compayré lists as "one of the characteristic features of the nineteenth century-not less remarkable because of the important part which women, by their abstract reflections or in their practical efforts, have taken in the progress of pedagogy." Although many of the theories advanced by these women might today seem commonplace, it must be remembered that at the time of their writing many were remarkable if, indeed, not revolutionary. Using original texts, this paper intends to set forth the educational theories, especially those ideas concerning physical education, of four women who wrote during the last decades of the eighteenth century. All had experience, formal or informal, with educational activities. Mary Wollstonecraft and Jeanne-Louise-Henriette Campan established and conducted schools; Stéphanie Félicité du Crest, la Comtesse de Genlis, was tutor to a large group of royal children; Josefa Amar y Borbon was an active member of a Madrid Society concerned with the creation of primary schools. All four women stressed an improved education for girls; all emphasized the importance of healthy physical activities for girls; each in her own way exerted considerable influence upon her own society. All might reasonably be regarded as pioneers in physical education for women.

1. Gabriel Compayré, History of Pedagogy (New York: D.C. Heath and Co., 1885), pp. 478-479.

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April 14, 1973
4:15 p.m.

PHYSICAL EDUCATION FOR WOMEN AT THE UNIVERSITY OF WISCONSIN, 1863-1913: A HALF CENTURY OF PROGRESS. Mary L. Remley, University of Wisconsin, Madison; Nancy Struna, Andrews School for Girls.

The development of the physical education program for women at the University of Wisconsin has a history which predates the actual establishment of a department by more than a quarter century. With the admission of the first females to the Normal School in the 1860's University authorities expressed interest in the physical welfare of women, but there is no evidence of any organized plan of physical training for them. Women students found their own outlets for recreational pursuits, primarily in the forms of hiking, cycling or croquet. Various individuals made sporadic efforts to offer programs of physical culture but these were short-lived. Miss Clara Ballard's voluntary gymnastics classes of 1889 proved to be the exception, however, and provided the foundation for a program which has been in existence for more than seventy-five years. During the period under study physical education for women appears to have four rather distinct, but overlapping stages of development: (1) Early concern of University officials for the health and physical well-being of females on the campus with no program implementation. (2) Development of individual recreational interests as leisure pursuits. (3) Participation in gymnastics classes offered on a volunteer basis. (4) Incorporation of calisthenics and sports and games into a University curricular requirement. Undoubtedly, the tenor of the times, a general increase in the emphasis on the physical welfare of women as well as the changing role of women in society contributed to this development at any stage. Not to be overlooked, however, were three additional major sources of support: (1) The women students, themselves, whose interest in and agitation for physical activities was evident throughout the period and who were a potent factor in securing space, equipment, facilities and teachers to satisfy their needs and desires. (2) The continuing support of activities for women from University officials, particularly the Board of Visitors, an advisory group to the Board of Regents with strong influence in matters of the University. (3) Faculty such as Clara Ballard, Abby Shaw Mayhew and Blanche M. Trilling whose indefatigable energy cannot be underestimated in the success of physical education for women at the University of Wisconsin.

Nancy Struna
Andrews School for Girls
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April 14, 1973
4:30 p.m.

BILL BOWERMAN: CATALYST OF THE AMERICAN JOGGING MOVEMENT.

William H. Freeman, Gardner-Webb College.

Prior to the 1960's there was little organized jogging in the United States. Though some groups did practice running for fitness, such as the "Run-For-Your-Life" program of the YMCA, there was no readily available program known throughout the nation. Bill Bowerman, track coach at the University of Oregon, possessed a keen interest in physical fitness. During a trip to New Zealand late in 1962, he was introduced to a newly-popular activity called "jogging," practiced by groups of people of all ages who met regularly to run for fun and fitness. It was strictly non-competitive, with physical fitness as the primary goal. It was originated in that country by a prominent track coach, Arthur Lydiard, who had set out to organize groups of people into local jogging clubs. Bowerman ran with a club and discovered that he was in a very poor state of fitness. When he returned to the U.S. early in 1963, he immediately began speaking about his new discovery, starting with large groups of interested persons in Eugene, Oregon. After several weeks he realized the need to determine how much exercise the average adult needed. He joined forces with a local cardiologist, Dr. W.E. Harris, and gained the sponsorship of several groups, including the Oregon Heart Association, to research adult fitness in a carefully monitored jogging program. The results of the study, conducted during 1965-1966, were published in the A.M.A. Journal and were disseminated throughout the U.S. by the news media during 1967-1968. An early booklet explaining the jogging program was prepared by Bowerman and Harris, circulating widely after its appearance early in 1966. In 1967 the paperback book entitled Jogging appeared, and the interest in jogging as a fitness activity soon reached the "fad" level as multitudes of people attempted their own jogging programs. After 1968 Bowerman gradually withdrew from the public aspects of the jogging-for-fitness movement, feeling that he had made his contribution and was satisfied to let others continue the work. Though jogging did not last as a fad, it is still practiced widely, as seen by the newer books related to jogging and the similarly-oriented, but broader-based, book on Aerobics, which appeared about one year after the jogging book was published.

This paper is the outgrowth of a portion of a dissertation entitled A Biographical Study of William J. Bowerman, completed at the University of Oregon.

William H. Freeman
Dept. of Health and Physical Education
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Boiling Springs, N.C. 28017

April 14, 1973
4:45 p.m.

WALTER J. WITTICH: PHYSICAL EDUCATOR, 1885-1953.

Anna Beth Culver, University of Wisconsin-La Crosse.

The career of Walter Wittich was, in great measure, the motivating influence which brought national prominence to the Division of Health, Physical Education and Recreation to what is now known as the University of Wisconsin-La Crosse. Although the first physical education building on the La Crosse Campus—Wittich Hall—was dedicated to him, no other recognition appears in evidence to remind us of his importance in the field. The purpose of this research was to locate and assemble the material relevant to W. J. Wittich's training, show the contributions he made to the area of health, physical education and recreation at La Crosse State College, and demonstrate his interest and influence in state and national physical education affairs. In addition, it was hoped an insight into his philosophy and character might be discovered. The historical method of research was employed to collect all primary source materials which included personal documents, diaries, and letters, as well as books written by and about him. Other pertinent historical evidence included correspondence and interviews with those who knew him personally, both students and peers, throughout the country. The results of the research indicate that his administration encompassed six revisions of the physical activity offerings, saw the introduction of a four year course in physical education and the acceptance of academic minors, implemented the recreation major, and laid the ground work for graduate studies in physical education. Evidence of his contribution to the field of physical education and health can be found in the writings published in state and national publications and in speeches presented at meetings and conventions of the asscciation. His community service, assisting the Red Cross and the War Effort during World War I and II, was unlimited. During the years 1917-1953, he was an inventor, a writer, a leader and a teacher who instilled professional attitudes and competence in the students planning to be teachers in the area of physical education. The impact of his career is felt by students, the university and the community, and the physical education profession generally, and is exemplary of the contributions of a dedicated physical educator.

Anna Beth Culver
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La Crosse, Wisconsin 54601

April 14, 1973
5:00 p.m.

THE ROLE OF GEORGE LOUIS MEYLAN, M.D., IN THE AMERICAN PHYSICAL EDUCATION MOVEMENT. Richard G. Wettan, Queens College of the City University of New York.

The purpose of this project was to investigate the role of Dr. George L. Meylan in the American physical education movement and to assess Dr. Meylan's role in terms of the age in which he lived and the profession in which he served. In addition this project attempted to arrive at a better understanding of the ideals, beliefs, practices and importance of Dr. Meylan. In order to tap the best available sources numerous friends, relatives, colleagues and contemporaries of Dr. Meylan were contacted in person, by telephone or through letters. An exhaustive search was made to uncover all of Dr. Meylan's writings and references to Dr. Meylan or his work. Particularly helpful were the Marsh Memorial Library at Springfield College, Columbia University Library in New York, the American Camping Association Library in Bradford Woods, Indiana, the National Young Men's Christian Association Library in New York and the Ohio State University Library. Dr. Meylan was an intimate friend of many of our early pioneers and he served in various organizations with these leaders. Meylan's record of organizational service can be matched by few men. Meylan was a stalwart fighter against commercialism in athletics and camping and through his writing and teaching he helped many to see the educational value of physical education, athletics and camping. Perhaps the main reason why Meylan is relatively unknown is that he never had graduate prodiges to carry his name or his work forward.

Dr. Richard G. Wettan
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April 14, 1973
5:15 p.m.

A VIEW OF THE PROFESSED SELF-CONCEPT AND PERSONALITY TRAITS OF INTERCOLLEGIATE WRESTLERS AND BASKETBALL PLAYERS.* Owen J. Holyoak, Robert E. Allen, Clifford A. Boyd, Paul J. Wittmer, University of Florida

The purposes of this investigation were: 1) to determine if differences exist between college wrestlers and college basketball players on sixteen professed self-concept factors and sixteen personality factors; 2) to determine if differences exist between the actual results of a personality factor test and those predicted by college wrestlers and basketball players. The subjects were 29 prospective members of the varsity wrestling team and 22 prospective members of the varsity basketball team enrolled at the University of Florida during the fall quarter 1971. Each subject was asked to rate himself on a scale ranging from one to ten on the sixteen factors identified by the Cattell 16 Personality Factor Test. The factors were analyzed independently and the results were judged to be an indication of the subject's professed self-concept. The subjects were then asked to complete the Cattell 16 PF Test in order that a more extensive profile of the sixteen personality traits could be developed. To insure testing uniformity, subjects were given standardized instructions prior to the administration of the tests. The data were analyzed using the Wilcoxon Rank-Sum Test and appropriate t-test. The .05 level of significance was accepted for all statistical analyses. The results indicated that the basketball players used in this study were significantly (P = .05) more tender-minded, sensitive, and sociable than the wrestlers. The wrestlers' personality traits were found to vary from the prediction of their own professed self-concepts, while the basketball players as a group saw themselves as average on the majority of the predicted self-concept factor.

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* This study was supported, in part, by the College of Physical Education, Health, and Recreation at the University of Florida

Robert E. Allen, Ed.D.
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April 14, 1973
4:00 p.m.

THE EFFECT OF A FOOTBALL SEASON ON THE PERSONALITY OF HIGH SCHOOL ATHLETES.Thomas D. Thomes, R. John Young & A. H. Ismail, Purdue University.

The purpose of the study was to investigate the effect of a competitive football season on the personality dimensions of high school varsity football team players (n=50). Personality data were collected using the Cattell 16 P.F. Questionnaire. Each player was ranked according to general football ability on the basis of a coaches' rating. The t-test was used to compare: (a) the initial and final sten scores of the total group, (b) the high and low ability groups (n=12 each) initially and finally, and also (c) the initial and final sten scores of the high and low groups. It was found that: (1) when the total group was compared initially and finally, no significant differences were observed; (2) at pre season testing the high and low ability groups differed significantly on factors C - emotional versus mature and L - trustful versus jealous--the low ability group conforming to the test score norms on both factors; (3) at post season testing the high and low groups differed significantly on factor I - tough versus effeminate; (4) the high ability group differed significantly between initial and final testing on the same factor suggesting the observed personality modification was restricted to the high group, and (5) no significant difference existed between the pre and post scores of the low ability group on any of the 16 personality factors. On the basis of these findings, it was concluded that the personality of high ability varsity football players may undergo subtle modifications during a competitive football season while the low ability players appear unaffected in terms of personality modifications.

Thomas D. Thomes
Central Catholic High School
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April 14, 1973
4:15 p.m.

THE RELATIVE EFFECTIVENESS OF TEACHER FEEDBACK UPON MOTOR SKILL WHEN UTILIZING VIDEOTAPE RECORDING. Dr. Robert E. Kraft, Christopher Newport College of the College of William and Mary

It was the purpose of this study to determine the effects of teacher feedback upon motor skill when utilizing videotape recording in the activity of bowling. The combination of teacher feedback and videotape recording was compared to each method in operation singularly. The study included a total of 45 male undergraduate students enrolled in bowling classes at Syracuse University during the 1971 Fall semester. All subjects had previous bowling experience. Each subject was randomly assigned to one of three experimental treatments based upon a pre-test score in bowling. The pre-test consisted of the total pinfall for four trials or 40 frames in bowling. The treatment groups consisted of a teacher feedback group, a videotape recording self-analysis group, and a combination group of teacher feedback and videotape recording. Each treatment group received an identical amount of bowling instruction, bowling activity, and feedback. The subjects participated in bowling twice a week for 12 weeks. Each subject bowled two trials each meeting. All subjects received the appropriate feedback for their group based upon one frame of bowling each class meeting. Two instructors provided the feedback to the two teacher feedback groups, and each subject had equal exposure to each instructor. The data were based upon each treatment group's mean bowling score in terms of the total weekly pinfall. A chart of progress was developed for each treatment group based upon the mean weekly pinfall in order to compare the improvement patterns of each group. The proposed design employed to analyze the data was analysis of variance for repeated measures. The primary purpose of this analysis was to determine if any significant differences occurred between the treatment groups in bowling skill. Multiple t ratios were used in order to make comparisons among the means in the final test. The results of the analysis of data revealed the following findings: 1. There were significant differences between the three treatment groups in bowling skill at the .01 level. 2. There were significant gains achieved in bowling skill across the treatment groups at the .01 level. 3. There was a significant difference in the improvement of bowling skill at the .05 level favoring the combination teacher feedback and videotape group when compared to either the teacher feedback group or the videotape self-analysis group in the final test. 4. There was no significant difference in bowling skill between the teacher feedback group and the videotape self-analysis group.

Dr. Robert E. Kraft
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April 14, 1973
4:30 p.m.

STIMULUS VARIATION AND LEARNING FROM LECTURE. Winnefred L. Wyckoff, Oregon State University.

The objective of the study was to determine the effect of teacher movement and gesturing while lecturing, on student recall of the factual information presented. Twelve pre-service teachers and 48 public school students were randomly selected from a Micro-teaching Clinic. The teachers were video taped using high and low levels of stimulus variation while lecturing. Student test scores were analyzed to determine Treatment, Lecture, and Order effects. Increases in the frequency of teacher movement and gesture resulted in improved performance by secondary students on both lecture tests, $r = .62$ and $.92$ respectively. Elementary student performance was significantly lowered by an increase in stimulus variation, $r = -.91$ and $-.97$ respectively. The conclusion was that the stimulus variation tested in this study had significant but differential effects upon secondary and elementary students.

Winnefred L. Wyckoff
Department of Physical Education
Oregon State University, Corvallis, Ore

April 14, 1973
4:45 p.m.

COMPARISON OF TWO METHODS OF TEACHING GOLF. Danny R. Mason, Texas Tech University; John E. Burkhardt, Texas Tech University.

The purpose of this study was to investigate the effects of two methods of teaching golf. The subjects were sixty-three male college students enrolled in beginning golf, had played no more than three rounds of golf during their life and had received no previous golf instruction. Before instruction was begun each group was given written copies of the general rules of golf and received one and one-half hours of group discussion regarding rules, etiquette, and general playing procedures. All subjects were required to play nine holes of golf and present an attested score card with two signatures before their first instructional period and again during the last class meeting of the semester. Group one, which consisted of thirty-seven subjects, was taught the basic fundamentals of golf by the traditional method of starting with the eight or nine iron and practiced with eight or nine irons for the duration of the semester. Group two, which consisted of twenty-six subjects, was taught the basic fundamentals of golf by beginning with the number three wood and practiced with the number three wood for the duration of the semester. The subjects met for sixteen periods, one and one-half hours in length. In addition to the above mentioned instruction, all subjects spent one and one-half hours on the putting green receiving instruction and practice in putting and one and one-half hours of instruction in chipping and approach shots to the green. It was found through the use of the analysis of variance technique that the mean nine hole and mean eighteen hole scores for the two groups were not statistically different prior to or following the instructional period. Comparison, using the t-[illegible], did reveal that both groups did make significant improvement on their golf scores on both nine hole and eighteen holes. It was concluded that either the three wood or the short irons could be used as the primary teaching tool in beginning golf classes at the college level.

Danny R. Mason
Department of Physical Education
Texas Tech University
Lubbock, Texas

April 14, 1973
5:00 p.m.

THE DEVELOPMENT OF A GOLF PUTTING TEST. Lea Larson,
Oklahoma State University.

The purpose of this study was to develop a valid and reliable indoor golf putting test. Subjects of two skill levels were examined throughout the study, beginning and intermediate golfers. Forty-two beginners and twenty-six intermediates participated in the study. During the putting grid test each subject took twenty trials from each of five predetermined distances (four, eight, twelve, sixteen, and twenty feet respectively) to a cup imbedded below the surface of a strip of G-50 Astro Turf. The target, the cup, was surrounded by a grid. The lines in the grid were four and one fourth inches apart. The target was given a 0, 0 value. Each square was given a number pair (1,1; 1,2; 6,6; etc.) to designate the coordinates of that particular square. Each trial was recorded both graphically and numerically on the subject's score card. Following the testing session the pairs of numbers were translated to what was known as a "converted score." The converted score for each trial was the distance from the center of the square that the ball stopped in to the center of the hole. The formula $c = 4.25(a^2 + b^2)$ was utilized to convert the raw score to the converted score. The coordinates of each point were a and b. The "test converted score" was the total of the twenty converted trial scores for each test distance. The practice putting green test consisted of twenty predetermined holes on a practice putting green. The subject's score for each hole was indicated by the number of strokes required to putt the ball into the hole. The total number of putts required for all twenty holes composed the subject's practice putting green test score. Reliability was determined by the test-retest method. Validity was established by comparing each subject's score on the putting grid test with the total score for the practice putting green test. Reliability and validity were determined for the first ten trials, the first fifteen trials and for the twenty trials. The fifteen trial putting grid test from twelve feet was the most valid test for the beginning group (0.4692). The ten trial putting grid test from four feet was the most reliable test for the beginning group (0.7327). The twenty trial putting grid test from eight feet was the most valid test for the intermediate group (0.4583). The fifteen trial putting grid test from four feet was the most reliable test for the intermediate group (0.9107).

Lea Larson
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April 14, 1973
5:15 p.m.

INTRA-INDIVIDUAL VARIABILITY OF NORMAL AND EDUCABLE MENTALLY RETARDED BOYS ON A TEST OF THROWING ACCURACY. D. Alan Dobbins, University of California, Berkeley.

The purpose of this study was to compare the intra-individual variability, the reliability of intra-individual variability, and the relationship between intra-individual variability and performance of a group of educable retarded boys (N = 71. CA = 102± 11.9 months) and a group of normal boys (N = 71. CA = 100.7± 13.9 months) on two overarm accuracy throwing tasks. The throwing tasks were designed to assess independently the vertical and the horizontal components of throwing accuracy. A 6 foot target area divided into 15 parallel and equal zones (4.8 inches wide) was constructed for this purpose, the horizontal component of accuracy assessed with the target oriented so that zones were parallel to the ground, the vertical component assessed with the target rotated 90 degrees, the parallel zones then being at right angles to the ground. The subject was directed to aim all throws at the center zone. Twenty-eight trials were given under each condition; the scoring system used assigned a score of zero for trials in which the center zone was hit, one point for each zone progressively farther away from the center zone. The mean intra-individual variability of the retarded group on both tasks was significantly greater (.01 level) than that of the normal group. Split-half reliability coefficients for intra-individual variability ranged between .73 and .89 for both groups on the two tasks. The level of performance was expressed a) as the constant error (CE) and b) as the average error (AE). The correlations between CE and intra-individual variability for the two groups were low for both tasks. When level of performance was expressed as the AE all correlations were .90 or higher.

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April 15, 1973
11:00 a.m.

THE RELATIONSHIP OF SELECTED DEVELOPMENTAL VARIABLES IN EMR CHILDREN. Wendell P. Liemohn, Indiana University.

The purpose of this study was to determine if relationships existed between selected (1) gross motor, (2) cognitive/fine motor, and (3) behavior/social variables in educable mentally retarded children. The sample consisted of the children enrolled in the Indiana University Developmental Training Center (DTC) programs in 1972. The children ranged in age from 6-12 years, and included 15 girls and 33 boys. Because some of the children were in residence for as short a period as two weeks, and because of the continual modification of our testing program, approximately one half of all the children were evaluated on (1) all of the behavior/social variables and (2) IQ; a minimum of 75 per cent of all the children were evaluated on all of the fine and gross motor variables. In addition to being retarded, many of the children had behavior disorders. The gross motor items administered included the Cratty Gross Motor Test and selected items from the AAHPER-Kennedy Foundation Special Fitness Test. The cognitive/fine motor tests administered included the Wechsler Intelligence Scale for Children and the Developmental Test of Visual-Motor Integration. The behavior/social tests utilized included the DTC Behavior Checklist and the Vineland Social Maturity Scale. Also included in the correlation matrix were the physical components of age, sex, height, and weight. As expected, many high intra-correlations were found within each group of variables. In addition, significant inter-correlations were found between several of the gross motor items and the cognitive/fine motor items. A few relationships were also found between the aforementioned two categories and the behavior/social items. It would appear that in EMR children in this study there are: (1) relatively high relationships between certain gross motor and cognitive/fine motor abilities, and (2) indications of relationships between (a) behavior/social variables and (b) motor ability.

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April 15, 1973
11:15 a.m.

THE EFFECTS OF COACTION AND SELECTED GROUPING PROCEDURES ON THE LEARNING AND PERFORMANCE OF A MOTOR TASK BY EDUCABLE MENTALLY RETARDED PUPILS. Linda Sue Hansen, S.U.C. Brockport.

The fifty four educable mentally retarded Ss consisted of pupils who were between the ages of 11 and 16 and had I.Q.'s ranging between 50 to 75. Thirty six of the above Ss were paired and randomly assigned to one of the three following -groups: (1) intra-class group (Ss in the same class), (2) inter-class group (Ss from two different classes), and (3) alone group. Each of the additional 18 Ss were paired with one of the Ss in either the intra-class group or the inter-class group when it was necessary to create an inter-class pairing within specific sub-groups. Each of the groups consisted of two sub-groups. Ss in each sub-group were tested in two different phases. The first phase was according to the criteria which had been established for learning; the second phase was according to the criteria which had been established for performance. The criterion established for both phases were represented by a predetermined number of trials. Results from pilot work indicated that ten trials were sufficient for Ss to learn the task. In order to investigate what effects coaction and selected grouping procedures had on learning and performance, a novel task was required. A tapping test was the selected task. Ss were given ten trials for phase I (learning) and phase II (performance). Results of a repeated measures ANOVA technique indicated that learning had continued into the second phase of testing. Results of an analysis by means using the means of the first and second set of trials as criterion scores produced significant results only in factor A (phase I and phase II). Since there were no significant differences with factor B (groups) and factor C (sub-groups), the significant results in factor A were contributed to the practice effects of the first ten trials. It was concluded that coaction and selected grouping procedures, as employed in this investigation, did not have a significant effect on the learning of a simple motor task.

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287 Great Road Brockport
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April 15, 1973
11:30 a.m.

THE EFFECTS OF A PROGRAM OF MODERN EDUCATIONAL DANCE ON THE PERCEPTUAL-MOTOR SKILLS AND PSYCHOLINGUISTIC ATTRIBUTES OF TRAINABLE MENTALLY RETARDED CHILDREN. John Arwyn George Gittins, University of California

Current theories, associated with the names of Kephart, Doman and Delacato, among others, suggest a progressive hierarchy of skills from motor, through perceptual to cognitive. The aim of the present experiment was to determine the effect if any, of a period of modern educational dance on measurable physical, perceptual-motor, psycholinguistic and intellectual skills of trainable mentally retarded children attending a public special education school. Sixty TMR children were randomly allocated to three groups. One group (Experimental) received sessions of modern educational dance three times weekly for a period of twelve weeks; the second group (Hawthorne) had quiet classroom activities (records, story-telling, games and films, etc.); the third group had no extra activities. At the end of the experimental period all children were tested for perceptual-motor skill (Cratty, Los Angeles P.M.A. Test), body image (Goodenough Draw-a-Man), psycholinguistic (I.T.P.A.) and intellectual (WISC) skills. Differences in post treatment performance between the three groups were tested by analysis of co-variance. Three of the tests discriminated in favour of the experimental group, namely Visual Closure (I.T.P.A.), Gross Agility (Los Angeles P.M.A. Test) and Draw-a-Man (Goodenough). No significant differences were found for the other tests administered. It might be that a longer period of treatment would have yielded more extensive effects, but in the given experimental conditions of this inquiry, gains were restricted to skills which clearly have elements in common with modern educational dance.

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April 15, 1973
11:45 a.m.

THE EFFECTS ON MOTOR PERFORMANCE OF SETTING AN OVERT LEVEL OF ASPIRATION BY MENTALLY RETARDED STUDENTS. Bill Kozar, Texas Tech University.

The purpose of this study was to determine the effects of setting an overt level of aspiration (OLA) on the standing long jump performance of mentally retarded students. Based on research findings with students of normal I.Q. it was hypothesized that mentally retarded students setting an OLA would be striving for a clearly committed observable goal and their performance would be superior to mentally retarded students not setting an OLA. Forty mildly and moderately retarded students were randomly assigned to one of two groups: 1) OLA group, 2) control group. All students were given six standing long jump trials with from 60 to 120 seconds rest between trials. The long jump mat was clearly marked in feet and inches (lines and numbers) on both sides. The control group was simply asked to jump as far as they could on each trial. The OLA group was asked before each trial to point to a line on the mat where they actually expected to jump on the next trial. The study revealed that no statistically significant differences existed between the groups in standing long jump performance. The results further indicated that the OLA group failed to lower their discrepancy scores significantly over trials.

Bill Kozar
Department of Physical Education
Texas Tech University
Lubbock, Texas

April 15, 1973
12:00 noon

DEVELOPMENTAL CHANGES IN MOVEMENT CHARACTERISTICS OF THE PUNT*

Alison Poe, University of Northern Iowa

The purpose of this longitudinal study was to determine the changes in movement characteristics of the punt in one subject over an eight year period. The data was from a longitudinal study by Dr. Lolas Halverson at the University of Wisconsin. Film records of the performance of the punt were obtained for one boy from the age of 2 years, 9 months through 11 years, 4 months. Fifteen film records were made at 3 month intervals through ages 3 and 4; at 6 month intervals through ages 6 and 7; and, at one year intervals through ages 8 to 11. Movement characteristics studied included: the steps in the approach to the kick, the release of the ball, arm and leg action, trunk action, timing relationships between segment actions, angular velocities of the thigh and knee, and variability of the traits at various age levels. Findings revealed the following developmental changes:

1. The approach to the kick progressed from one short, wide step at early ages to a two step, long stride sequence with a brief flight period prior to contact at the final age studied.
2. Ball release preceded placement of the support foot at every age with the length of time prior to placement increasing with age.
3. At earliest ages, both arms dropped to the sides following release; marked arm-leg opposition appeared at about 4 years of age and remained a consistent trait.
4. Angular velocity of the kicking knee showed incremental changes until measures comparable to adult data were observed at age 8.
5. All traits tended to show less variability with age.

Four levels of development were tentatively identified on the basis of the observed changes in movement characteristics.

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*This study was supported in part by a grant from the Wisconsin Alumni Research Foundation and was conducted in the Motor Development and Child Study Center at the University of Wisconsin, Madison.

Alison Poe
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Cedar Falls, Iowa 50613

April 15, 1973
11:00 a.m.

EFFECT OF ANGLE OF RELEASE ON THROW FOR DISTANCE TEST. Lynn W. McCraw, The University of Texas at Austin.

The purpose of this study was to determine the effects of the angle of the throw for distance test. An examination of test directions in the literature revealed none that included the stipulation that the throw should be made at a 45-degree angle. The softball throw for distance test was administered on three successive class sessions to 99 seventh-grade, 101 eighth-grade, and 87 ninth-grade boys. Three throws were allowed during each of the three administrations and each one of the three scores was recorded. The angle of the throw was also recorded as 45 degrees, less than 45 degrees, or more than 45 degrees. No mention was made of the angle of the throw during the first and second administrations, whereas prior to and during the third administration, subjects were instructed to throw at a 45-degree angle. The t-test was used to compare performance of the groups on successive days. Comparisons were also made of the best scores obtained while throwing at 45-degrees, less than 45 degrees, and more than 45 degrees. Subjects were classified as excellent, fair, or poor on the basis of their performance and mechanics of throwing, and an analysis was made of the proficiency in throwing at the proper angle before and after receiving specific instruction. Throws made at an angle of 45 degrees were significantly greater than those made at more or less than 45 degrees. Mean differences were 7.78, 12.71, and 14.58 for the 7th, 8th, and 9th grades respectively. Subjects responded to instruction relative to the angle of the throw since 57 percent of the throws during the third administration were at 45 degrees as compared with 37 percent during the second administration. A substantially larger proportion of students rated as excellent threw at the correct angle than did those rated as fair or poor. The means of the third administration were significantly larger than those for the second administration; however, the improvement was as large from the first to the second administration for students in the 7th and 8th grade suggesting that differences were due to factors other than the angle of throw.

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The University of Texas at Austin
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April 15, 1973
11:15 a.m.

THE INFLUENCE OF OBJECT SIZE, SPEED, DIRECTION, HEIGHT, AND DISTANCE ON THE INTERCEPTION OF A MOVING OBJECT.

Forty boys and forty girls, enrolled in second grade, participated in a study assessing the influence of a moving object's distance, size, direction, height, and speed and the subject's sex on the interception of a moving object. An experimental apparatus was designed to permit spherical objects of two sizes (six inch and eight and one-half inch diameters) to move two directions (center and side) and three heights (high, middle, and low) for distances of either eight feet or sixteen feet at either a fast or slow speed. The child's task was to strike the moving object with a paddle before the object moved eight or sixteen feet. The object moved toward one of six points, which were equally within the subject's reach. A paddle with a five-inch disc and a two-inch extension in the handle beyond the four-inch grip permitted the child to reach the object before it moved eight or sixteen feet and then stopped. A successful object interception was made only when the child hit the ball before it stopped. The determination of a successful object interception was accomplished by comparing two time points recorded on a two channel recorder: one (1) channel indicated the time point when the object moved either eight or sixteen feet; and the other channel indicated the time point when the subject's paddle contacted the object. The comparison of these two time points revealed the success of the child's object interception. Frequencies of object interception were compared for both sexes for all the object distances, sizes, directions, heights, and speeds within the study. Analysis of variance indicated the frequency of object interception was influenced by the subject's sex, and the object's distance, direction, height, or speed within the following significant interactions: distance by direction, distance by height, size by direction, direction by height, height by speed, distance by direction by speed, size by sex by speed, and distance by direction by height by speed. All the main effects, except object size, were significant.

Marcella Davis
Department of Physical Education
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April 15, 1973
11:30 a.m.

CASE STUDIES IN THE DEVELOPMENT OF ONE-HANDED STRIKING*

Christine J. Harper, University of Wisconsin-Madison, Nancy Struna, St. Andrew's School for Girls, Willoughby, Ohio

The purpose of this report is to describe the movement characteristics of a three year old boy and girl as they performed a one-handed striking task over a one-year period. Observations were made at 4 month intervals as part of a filmed, longitudinal study on the development of motor patterns directed by Lolas E. Halverson, University of Wisconsin-Madison. The one-handed striking pattern was elicited by asking the children to hit a suspended ball as hard as possible toward a wall. The sequence and timing of joint actions were studied using tracings of selected trials taken from 16mm. film. Over the year the girl's pattern changed 1) from no weight shift to a shift of weight with a step toward the ball, and 2) from initiation of the forward motion of the racket with horizontal adduction of the striking arm to initiation of the motion using simultaneous pelvic and spinal rotation. Two major changes observed in the boy's pattern were 1) a progressively longer stride toward the ball with the contralateral leg, and 2) a progressively greater differentiation of pelvic and spinal rotation out of simultaneous pelvic-spinal rotation. Additional movement characteristics observed include 1) those which varied within subjects' performances (length of stride, range of movement), 2) those which varied between but not within subjects' performances (grip, joint action in the legs, wrist action at and through contact), and 3) those which showed little variation both within and between subjects' performances (head position, joint action at the wrist and shoulders during the backswing, closed eyes at contact).

*Supported in part by a grant from the Wisconsin Alumni Research Foundation and conducted in the Motor Development and Child Study Center, Department of Physical Education for Women, University of Wisconsin-Madison

Christine J. Harper
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April 15, 1973
11:45 a.m.

THE EFFECT OF GUIDED PRACTICE ON OVERHAND-THROW BALL VELOCITIES OF KINDERGARTEN CHILDREN* Lolas E. Halverson, Mary Ann Roberton, M. JoAnne Safrit, Thomas W. Roberts. University of Wisconsin Madison, Wisconsin.

This report, the first of three on the effects of teaching kindergarten children the overhand throw, compares the children's final ball velocities to those of two control groups. Later reports will discuss the effect of instruction on the children's movement processes, and the relationship between velocity and movement process. Forty-five children from two intact kindergartens in a Madison, Wisconsin public school were randomly assigned by sex to (1) an experimental group which received a movement program including 120 minutes of guided practice in the overhand throw; or (2) a control group which received the same movement program but no exposure to the throw. A third group (N=24), randomly selected by sex from a comparable school, received no movement experience. Ten, side-view, filmed trials (16mm. - 64 frames/sec.) of each subject's throw for force were taken before and after a six-week period. Ball velocities for each trial were recorded simultaneously with the Roberts' velocimeter. Since one-way ANOVA's on both the pre and the post test velocities for each sex within each treatment group revealed no significant practice effect over ten trials ($p < .05$), the trial mean was used as each S's score. A two-way ANOVA (treatment x sex) indicated no significant difference between treatment groups ($p < .05$) at the beginning of the experiment. A two-way ANOVA (treatment x sex) for the post-test data still indicated no significant velocity difference ($p < .05$). Boys had significantly greater velocities than girls at both the pre and post-testing ($p < .05$). One hundred twenty minutes of guided practice in the overarm throw did not significantly change the ball velocities of kindergarten children compared to two groups with no formal throwing experience.

*This study was supported in part by a grant from the Wisconsin Alumni Research Foundation and was conducted in the Motor Development and Child Study Center, Department of Physical Education for Women, University of Wisconsin-Madison

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April 15, 1973
12:00 noon

AN ELECTROMYOGRAPHIC COMPARISON OF AN ISOKINETIC BENCH PRESS PERFORMED AT THREE SPEEDS. Mary Ridgway, Joel Rosentswieg, and Marilyn Hinson. Texas Woman's University.

Isokinetic exercise is based upon the control of speed during contraction rather than the amount of load (isotonic) or effort at a given angle (isometric). Isokinetic instruments typically provide a range of selectable speeds under the assumption that the slower the speed of movement the greater the potential resistance. The muscle action potentials (MAP) of the anterior deltoid, pectoralis major, biceps brachii, and the triceps muscle were studied by quantitative EMG during a bench press exercise at three controlled speeds. Bipolar surface electrodes with standard placement were employed throughout the study. Volunteer college women (N=11) performed 3 trials at each speed (1.5 sec., 2.0 sec., 3.5 sec./3 ft.) on a Super Mini Gym. All Ss were familiar with the exercise and the test procedures. Angles and hand grip were kept constant. Randomization of speed of contraction eliminated order effects and no verbal motivation was provided. Rest was controlled to negate fatigue. ANOVA and Duncan's Multiple Range Test were used to determine the significance of any differences obtained. The results indicated that the slower the speed of movement the greater the MAP output. In every instance each slower speed produced a significantly greater MAP ($P<.01$) than the compared faster speed except for the biceps brachii where the trend existed but was not significant for the moderate speed.

Appreciation to the Robar Mini-Gym Corporation of Independence, Missouri andthe Research Foundation of the Texas Woman's University for grants partially supporting this study is acknowledged.

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April 15, 1973
2:00 p.m.

ANALYSIS OF WINNING TIMES OF TRACK RACES FOR MEN IN MEXICO CITY 1968 AND MUNICH 1972. Ernst Jokl, University of Kentucky.

The winning times of the track running events for men at the 1968 Olympic Games deviated systematically from pre-Olympic world records: in all sprint events except the 110 meter hurdles new world records were established, while all races over 1500 meters or more were won in times below pre-Olympic world records. Between the end of the 1968 Olympic Games and the beginning of the 1972 Olympic Games not one world running record was improved. The winning times in the Munich 100 and 200 meters were slower than in Mexico City (10.1 vs 9.9 and 20.0 vs 19.8 seconds). But the performances under comparison were equal or better because electronic measuring devices were used for the first time in 1972; thus a correction factor of 0.2 seconds must be applied to the results to render them comparable to the hand-stopped times of 1968. Borsov ran in Munich as fast as Hines did in Mexico City. The United States 4x100 meter men's relay team at Munich which equaled the winning time of the Mexico City victors was actually faster. Milburn's 13.2 seconds race was the best ever as was Aki-Bua's 47.8. Conversely, the 400 meter and 4x400 relay times of the Munich winners were slower than those of the 1968 winners. The Munich 100, 200 and 4x100 meter results were equal to or better than those in Mexico City since only the latter were facilitated through the altitude. As regards the Munich 400 meters won in 44.7 seconds by Matthews, it is well to remember that shortly prior to the 1972 Games Collett (second in Munich) ran in 44.1 seconds at sea level. In Munich Wottle's poor 1:45.9 minutes in the 800 meter final and Vasala's 1500 meter winning time do not appropriately express the development of the record potential of the best middle distance runners during the decade since Peter Snell established his world record of 1:44.3 minutes. The most significant improvements in running are presently being made in the long distances. Viren won the 10,000 meters in Munich in the new world record time of 27:38.4 despite his fall during the first half of the race. A few days after the 1972 Games Puttemans established a new 5000 meter world record of 13:13.0. The evidence under analysis justifies the prediction of further progress in the near future in all running events. However, the growth curves of all track world records are now entering or have already entered their "flattening-out" or "asymptotic-deflection" phases. This means that the magnitude of future improvements will progressively decline.

Ernst Jokl
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April 15, 1973
2:15 p.m.

THE COMPILATION OF A SELECTED BIBLIOGRAPHY OF RELEVANT THESES AND RESEARCH IN INTERNATIONAL-COMPARATIVE PHYSICAL EDUCATION AND SPORT IN THE U.S.A. AND CANADA

Sandra Fonger
William Johnson
University of Illinois
Norma Green
Eastern Illinois University

Purpose: To identify and contact those colleges and universities in the U.S.A. and Canada offering Master's or Doctoral programs in physical education to request information on recent and relevant research in the area of International-Comparative Physical Education.

Procedures: During the Spring of 1972 request letters were mailed to 230 U.S. and Canadian colleges and universities. Second and third request letters were sent, if needed. The 13 volumes of Reported Research in Health, Physical Education and Recreation were also gleaned for appropriate studies.

Results: A total of 60 colleges and universities answered the request letters. Eleven had studies to report. The selected bibliography compiled during this study includes 187 theses and research studies relevant to the area of International-Comparative Physical Education. This bibliography adds substantially to the body of knowledge framework for this specialized field in our profession. Recommendations for further study or action include the following: (1) annotating the theses and research studies cited in the selected bibliography; and (2) making the selected bibliography available to members of the American Association of Health, Physical Education and Recreation.

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April 15, 1973
2:30 p.m.

CONCEPTS OF PHYSICAL FITNESS IN PHYSICAL EDUCATION: 1943-1968. Malcolm Stock, U.C.L.A.

It was the purpose of this bibliographical investigation to report and examine concepts of physical fitness in physical education as these concepts emerged from or related to influential developments. Because of the extreme sensitivity of the topic and emotion-charged dialogue associated with it, there exists a paucity of investigations in this area underscoring the significance of this historical-philosophical study. In an examination of concepts espoused by the physical fitness partisan organic developmentalists, this study focussed directly upon physical fitness, but an investigation into concepts advanced by the educational developmentalists contained within them ideas and notions relative to nearly all aspects of physical education. Historically, the five periods in chronological order consisted of, 1)World War II, 2) Postwar Period, 3) Korea, 4) Kraus-Weber, and 5) Viet Nam. Philosophically, seven concept classes were established and included, 1) need, 2) utility, 3) aims and objectives, 4) pronouncements and propositions, 5) attainment, 6) responsibility, and 7) motivation. Historical findings included the steady narrowing of the ideological breach in the profession relative to physical fitness. Concept recommendations included an endorsement of athletics; caution regarding claims associated with athletics, countering dissent, and supporting lifetime sports; reinforcing a connection between aspects of physical fitness and those of health; discontinuing discourse into an education "of" as opposed to one "through" the physical, and publicizing investigations revealing of a positive G.P.A.-P.F.I. correlation. Terminological findings include the fact that there exists numerous aspects of physical fitness, war related preparation being the original and clearest usage, organic development representing the most common usage, and that the term was diminishing in its descriptive appeal for a growing number of theorists. In terms of role, the physical fitness objective remains strongly supported in the literature and received support from the researcher on the basis of a systematic examination with all pervading concepts, ideas, and notions cited.

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April 15, 1973
2:45 p.m.

THE ROLE OF LACROSSE IN THE TRANSMISSION AND REINFORCEMENT OF INDIAN CULTURE. Dale P. Hart, State University College, Brockport, New York.

The function of lacrosse in ancient Indian society has long been disputed. Many historians claim that the Indians of North America played lacrosse for the purpose of military preparation. Others feel that the game was a manifestation of barbarian tendencies. Mayhem, brutality, and chaos are words which commonly characterize Indian lacrosse. In modern day society it has been found that sport is structurally related to culture. It serves to integrate and maintain the sociocultural patterns of a culture. Therefore it was hypothesized that ancient Cherokee Indian lacrosse served to transmit and reinforce that culture. The procedures were as follows. First, the socio-cultural literature relating to cultural transmission and reinforcement was perused, which resulted in the formulation of several principles and concepts relating to cultural transmission and reinforcement. Secondly, all available ethnographic data pertaining to the ancient Cherokee Indians was evaluated. Thirdly, all descriptions of the ritual and playing of Cherokee lacrosse were evaluated and synthesized. Fourthly, in view of the principles of culutral transmission and reinforcement, a merger of the ethnographic data and the Cherokee game of lacrosse was made. The findings indicated that the lacrosse of the ancient Cherokee Indians of North Carolina served as a major tool in the maintenance of their cultural patterns. For the Cherokees, the lacrosse game, even though appearing brutal and chaotic to the outsider, and the accompanying ritual represented a complex affair whereby members of that culture could reaffirm their tribal and religious beliefs in a ritualistic and emotional manner. Therefore militarism, mayhem, and chaos should not be the terms which characterize the lacrosse of the North American (Cherokee) Indians.

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April 15, 1973
3:00 p.m.

AN HISTORICAL SURVEY OF FOXHUNTING IN THE UNITED STATES, 1650-1970. Sherri L. Stewart, Texas Woman's University.

The growth and development of foxhunting in each part of the country from 1650-1970 was reported, and a detailed historical account of selected hunts which endured 50 or more years was written. A roster of the 318 hunts which have been registered with the Master of Foxhounds Association or the National Steeplechase and Hunt Association was developed. Personal interviews were conducted with several Masters of Foxhounds and other notable individuals. Questionnaires were mailed to Masters of the 117 hunts registered for 1970, and 55 per cent were returned, providing data concerning the current status of foxhunting. Major influences--like urbanization, suburbs, inflation, barbed wire, modern transportation--which appear to have affected the popularity of the sport were analyzed. Sixty-one tables comprised during the study presented the growth of foxhunting by decades from 1830 to 1970, with the number of hunts founded and disbanded in the six divisions of the United States for foxhunting. Tables were further constructed to show the number of hunts founded and disbanded in each state in which the sport has existed, and a summary of foxhunting for each state was presented in chronological order. Findings showed that foxhunting experienced its greatest popularity from 1930-1939. Since 1940 the popularity of the sport has decreased in the Eastern and Central States, remained the same in the Midwest, and has increased in the South. At present, Pennsylvania, Virginia, Maryland, and New York have the greatest number of registered hunts. More women in 1970, engaged in foxhunting than men.

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April 15, 1973
3:15 p.m.

SPECIFICITY OF CARDIOVASCULAR ENDURANCE TRAINING.

Calberth B. Riley, Jr. and James H. Johnson, Washington University, St. Louis, Missouri.

The purpose of this study was to determine the specificity of cardiovascular endurance training on a bicycle ergometer. Eighteen male subjects were tested on a heart rate response test of 160 beats-per-minute on a bicycle ergometer at the pace variations of 50, 60, and 80 rpm's with the resistance equal to the force of gravity on three kilograms. The subjects were then randomly divided into one of three training groups; each group to train at one of the three initial testing paces. Each group trained at only one pace, three-days per week for seven weeks, with equal total mechanical work. At the end of the training period all subjects were retested to the heart rate response tests at all three paces. For each group the mean gains from initial to final test were tested by a t-test for significance of the difference between correlated means. Analysis of covariance was used to determine whether there were any significant differences among the groups on the pace tests, and orthogonal comparisons were made to locate these differences. All three groups significantly improved performance on all three performance tests to the .01 level of confidence. No significant differences were found among the groups on any of the three performance tests. It was concluded that within the limitations of this study pace training appears to be general rather than specific with regard to cardiovascular endurance training.

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April 15, 1973
3:30 p.m.

RELATIONSHIP OF LEG STRENGTH TO THE PHYSICAL WORK CAPACITY OF BOYS AGE 7 TO 12 YEARS PEDALING A BICYCLE ERGOMETER.

Benjamin H. Massey, Arend Bonen, Janet Teeple, Peter Gifford,
Department of Physical Education, Physical Fitness Research Laboratory, University of Illinois at Urbana-Champaign, Champaign, Illinois

This investigation was undertaken to discover if the leg strength of boys age 7 to 12 years contributes significantly to their work capacity when subjected to an all-out work test pedaling a bicycle ergometer at progressively higher work loads. Twenty-three boys in the 7 to 12 year age range were tested on two occasions with a minimum of 7 days intervening between sessions. Age, height, weight, maximal extension force with each leg and both legs simultaneously, total work time pedaling a bicycle ergometer and mechanical work, $\dot{V}O_2$, $\dot{V}_E$, breathing rate and heart rate each minute of work were recorded. The work test consisted of pedaling a Monark friction ergometer at 50 rpm with pedal resistance initially set a 1.0 kp and increased by 0.5 kp increments at 3 minute intervals. Work terminated when the subject stopped or pedal rate could not be maintained. Effect of body weight was minimized by having the subject seated to the rear of the rotational axis of the ergometer pedals. Maximal leg force was measured utilizing a linear transducer-Brush recorder system. The subject's position simulated his position when pedaling the bicycle ergometer. The findings based on analysis of the data utilizing zero order, partial and multiple correlation procedures with age, height, weight and leg strength considered the predictive variables, and duration of work, total mechanical work and max $\dot{V}O_2$ the criteria measures, revealed that leg strength contributes significantly to the bicycle ergometer work performance of young boys.

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April 15, 1973
3:45 p.m.

CROSS TRANSFER DURING EXTENSOR SERIAL ISOMETRIC TRIALS. Dr. B. Robert Carlson, The University of Texas of the Permian Basin.

Cross transfer effects were examined in 45 male subjects who completed 10 isometric contractions of the right elbow extensor muscles. Treatment conditions included bimanual, crossed contralateral, and control conditions. Consideration was given to the effect of muscular strength on the performance of the serial contractions. It was found that the treatment conditions had different absolute levels of performance but similar fatigue curves. The strength groups had different absolute levels of performance and also had similar fatigue curves.

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April 15, 1973
4:00 p.m.